REVISED CLEANUP PLAN

REVISED CLEANUP PLAN
SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

Submitted To: Pennsylvania Department of Environmental Protection
Environmental Cleanup Program
230 Chestnut Street
Meadville, PA 16335-3481

Submitted By: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

Distribution:

2 Copies	Pennsylvania Department of Environmental Protection
1 Copy	United States Environmental Protection Agency
1 Copy	Trinity Industries, Inc.

February 2013

Project No.: 073-6009-100

A world of capabilities delivered locally

TRINCBI 0039108

Table of Contents

Volume 1 of 4

List of Tables

List of Figures

List of Design Drawings

Volume 2 of 4

List of Appendices

LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
AOC	Area of Concern
ASTM	American Society for Testing and Materials
CLP	Contract Laboratory Program
COA	Consent Order and Agreement
COC	Constituent of Concern
CQA	Construction Quality Assurance
CQC	Construction Quality Control
DQO	Data Quality Objectives
CWP	Cleanup Work Plan
EDD	Electronic Data Deliverable
FS	Feasibility Study
HASP	Health and Safety Plan
IA	Impacted Area
ID	Identification
ISS	In-situ Stabilization
MDL	Method Detection Limit
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
MS	Matrix Spike
MSC	Medium-Specific Concentration
MS/MSD	Matrix-Spike/Matrix-Spike Duplicate
NELAC	National Environmental Laboratory Accreditation Program
NIST	National Institute of Standards Technology
OSHA	Occupational Safety and Health Administration
PADEP	Pennsylvania Department of Environmental Protection
PE	Performance Evaluation
PPE	Personal Protective Equipment
ppb	parts per billion
ppm	parts per million
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAC	Quality Assurance Consultant
QAP	Quality Assurance Plan
QC	Quality Control
QMP	Quality Management Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RL	Reporting Limit
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SHASP	Site-Specific Health and Safety Plan
SHS	Statewide Health Standard
SOP	Standard Operating Procedure
SOW	Statement of Work

SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TDS	Total Dissolved Solids
TSCA	Toxic Substances Control Act
UCL	Upper Confidence Level
ug/l	micrograms per liter
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

CERTIFICATION BY PENNSYLVANIA PROFESSIONAL ENGINEER

All engineering calculations, drawings, and designs for this Revised Cleanup Plan were prepared by or under the direct supervision of the undersigned professional engineer licensed in the Commonwealth of Pennsylvania:

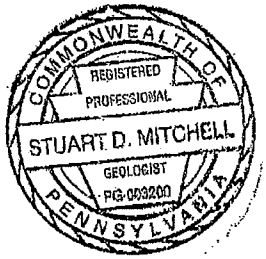
Veronica E. Foster 2/27/13

Veronica E. Foster, P.E.
Pennsylvania Professional Engineer – PE055426E

All interpretations of geologic and hydrogeologic data in this Revised Cleanup Plan were prepared by or under the direct supervision of the undersigned professional geologist licensed in the Commonwealth of Pennsylvania:

2/27/13

Stuart D. Mitchell, P.G.
Pennsylvania Professional Geologist - PG003200G



LIST OF SITE CONTACTS

Trinity Industries, Inc.

Terry Barrett, P.G., Remediation Projects Manager
Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207
Phone: 214-589-8409
Fax: 214-589-8075
terry.barrett@trin.net

Golder Associates Inc.

Joseph B. Gormley, Jr. P.E., Project Coordinator
Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428
Phone: 610-941-8173
Fax: 610-941-8174
Joseph_Gormley@golder.com

Veronica E. Foster, P.E., Lead Design Engineer
Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054
Phone: 856-793-2005
Fax: 856-793-2006
veronica_foster@golder.com

Stephen Anderson, Senior Project Scientist
Golder Associates Inc.
105 Bradford Road, Suite 420
Wexford, PA 15090
Phone: 724-935-6400
Fax: 724-934-2023

Mark Haney, Project Director
Golder Associates Inc.
670 Commercial Street, Suite 103
Manchester, NH 03101
Phone: (603) 668-0880
Fax: (603) 668-1199
Mark_Haney@golder.com

1.0 INTRODUCTION

This Revised Cleanup Plan has been prepared by Golder Associates Inc. (Golder), on behalf of Trinity Industries, Inc. (Trinity), for the South Plant property (South Plant or Site) in Mercer County, Pennsylvania. The Revised Cleanup Plan is submitted to the Pennsylvania Department of Environmental Protection (PADEP) for review and approval pursuant to Paragraph 7.g. of the Consent Order and Agreement (COA) executed by the Commonwealth of Pennsylvania on December 21, 2006.

In accordance with the COA and the PADEP approved schedule, Trinity submitted a Cleanup Work Plan (CWP, Golder 2011) to PADEP on March 25, 2011 that: a) summarized the nature and extent of impacts to soil/historic fill and groundwater at the South Plant that were above applicable Statewide Health Standards (SHSs), and b) proposed preliminary cleanup standards and response actions, including pre-deign investigations, to address those impacts. In a letter dated June 7, 2011, PADEP approved the CWP with modifications (See Appendix A-1).

In response to PADEP's June 7, 2011 comments on the CWP and in accordance with the COA and the PADEP approved schedule, Trinity submitted a Cleanup Plan (Golder 2012) to PADEP on January 12, 2012. PADEP deemed the Cleanup Plan (Golder 2012) administratively complete on January 30, 2012 and began its technical review of the plan.

In a letter dated April 27, 2012, PADEP noted that the Cleanup Plan was submitted in accordance with Act 2 and constitutes a Cleanup Plan as defined in Chapter 3, Section 304 of the Act. However, PADEP noted several deficiencies in the Cleanup Plan and disapproved it in accordance with the provisions of Act 2. A copy of that letter is included in Appendix A-2.

In response to PADEP's letter, Trinity met with PADEP on several occasions, discussed issues and exchanged information via telephone calls, provided additional data, and performed additional on-Site investigations to resolve the deficiencies/comments identified by PADEP. In a meeting on December 18, 2012, PADEP acknowledged that Trinity had addressed all deficiencies/comments and could proceed with revising the Cleanup Plan.

Accordingly, Trinity has prepared this Revised Cleanup Plan to do the following:

- Incorporate responses to PADEP's April 27, 2012 comments
- Incorporate the results of additional investigations performed at the South Plant Site
- Present the updated final response actions that are necessary to remediate impacts to soil/historic fill, surface water, and groundwater that are at and/or migrating from the South Plant to a combination of the Background, Statewide Health, and Site Specific cleanup standards under Chapter 3 of the Pennsylvania Land Recycling and Remediation Standards Act (Act 2)

The purpose of this Revised Cleanup Plan is to provide key information to and gain approval from PADEP for the design of selected response actions at the South Plant. The details of the design are addressed in the following sections:

- Background
- Pre-Design Investigation Results
- Selected Cleanup Standards and Response Actions
- Engineering Design
- Post-Remediation Care Plan
- Permitting
- Agreements with Third Parties
- Public Participation
- Schedule

2.0 BACKGROUND

2.1 General Site Description

The "South Plant" is defined collectively as the three parcels of real property that cover approximately 53 acres located at 100 York Street in the Borough of Greenville and Hempfield Township, Mercer County, Pennsylvania as shown in Figure 2-1. The surface boundaries of the South Plant are more particularly described in 1989 Deed Record 00945 in the Mercer County Recorder of Deeds. As indicated in the COA (Pennsylvania 2006), the term "South Plant" also includes any groundwater at and potentially migrating from the South Plant, if any, including groundwater (if any) that has migrated from these parcels.

The South Plant property is zoned for industrial uses and Trinity formerly operated a railcar manufacturing plant at the location. The general site layout and existing site conditions are shown on Figure 2-2. While there are currently no manufacturing activities at the Site and many of the buildings are vacant, the facility is occupied and sections of the Site are used for storage. The South Plant property contains approximately 15 buildings along with four exterior cranes and two transfer tables. These structures occupy about 1/3 of the property. The remaining areas of the South Plant consist of concrete and asphalt pavement, former building slabs, railroad track/sidings, areas with sparse vegetation, grassy open areas, and wooded areas. The South Plant is serviced by railroad tracks from the south and an active railroad line is located along the western property boundary.

While the South Plant is zoned industrial, it is located in a mixed use area consisting of residential properties to the north and east, industrial properties to the north and west, and wooded property to the south. An extension of the Erie Canal is located along the eastern boundary of the property and a stream, Mathay Run, crosses the southern portion of the property from east to the southwest. South of Mathay Run there is an area of mixed full grown trees and thick underbrush. Directly to the west of the South Plant are the following industrial properties:

- Track and right-of-way of the Norfolk Southern Railway Company (Norfolk Southern)
- Track and right-of-way of the Bessemer and Lake Erie Railroad (B&LE), a subsidiary of the Canadian National Railway Company (Canadian National)
- Shops and Yards of the B&LE

The Shenango River is located farther west just beyond the railroad yards. .

2.2 Overview of Historical Site Operations

The South Plant was previously owned by Chicago Bridge & Iron Company (CB&I). CB&I began operation at the South Plant in 1911 and manufactured large water tanks and other equipment for the railroad industry. In 1989, Trinity purchased the South Plant, refurbished the facilities, and began

manufacturing rail cars. Trinity continued to manufacture rail cars at the Site until 2000. The Site is currently inactive with Site workers performing only security and building/general Site maintenance.

2.3 Previous Regulatory Actions

2.3.1 RCRA Areas

In 1980, CB&I submitted a Part A Hazardous Waste Permit Application under the Resource Conservation & Recovery Act (RCRA) for its Greenville facility (South Plant) to enable the facility to store hazardous waste on-Site for more than 90 days prior to off-Site disposal. The Part A permit application covered two storage areas; a 20,000 gallon storage tank and a 55-gallon drum storage area.

In a letter dated December 18, 1980, the USEPA acknowledge receipt of the Part A permit application. In a follow up letter dated July 21, 1981, the USEPA indicated that based on the permit application information the facility met the RCRA requirements for Interim Status. In addition, the letter identified the processes the facility could use, the design capabilities, and the types of waste the facility could accept during Interim Status. In a subsequent letter dated January 19, 1983, the USEPA requested that CB&I provide a Part B permit application for the storage operations within six months.

In a letter dated March 25, 1983, CB&I requested that the USEPA withdraw the Part A Interim Status designation due to the closing of the facility. The letter also indicated that the storage facility was closed in accordance with an attached closure plan. Apparently CB&I had ceased production on November 1, 1982 and the last manifested waste shipment was sent off-Site on November 11, 1982.

The Part A permit application indicated that the operation of the existing facilities (20,000 gallon storage tank) began in November 1972. A Preliminary Assessment performed in 1986 by the Pennsylvania Department of Environmental Resources (PADER was the predecessor to PADEP) indicated that between 1940 and 1970 spent acid waste was disposed on-Site in a depression approximately 75 feet by 100 feet by 3 feet deep. The Preliminary Assessment indicated that based on interviews it appears that the acid disposal activities ceased in 1970 when off-Site commercial disposal was initiated.

Historical documentation of these areas was included as Appendix C of the RI Report (Golder 2010).

2.3.2 Solid Waste Disposal Areas

According to files provided by PADEP and the 1986 Preliminary Assessment, CB&I submitted a permit application (ID#300486) in 1975/1976 to continue on-Site disposal of waste sand from sand blasting operations. In response to various submittals, PADER issued a letter on June 23, 1976 that approved the disposal of the waste sand as was practiced at the time. No additional information was available in the files to indicate when disposal of waste sand was discontinued. However, CB&I discontinued all operations at the Site in November 1982, and disposal of waste sand in this area is likely to have ceased

prior to or on this date. Historical documentation of this disposal area was included as Appendix D of the RI Report (Golder 2010).

Based on PADEP investigations, impacted soils from the North Plant were allegedly disposed at the South Plant during construction of the New Paint Shop at the North Plant. The material was allegedly disposed at the Old Ballfield, which is located at the South Plant. A drawing dated January 1976, submitted as part of the waste sand disposal permit application by CB&I, also shows elevations for the alleged disposal area near the Old Ballfield. On the 1976 drawing, the elevations in the area range from 936 to 938 feet above mean sea level (msl). On a recent topographic survey, the elevations in the same area currently range from approximately 938 to 947 feet above msl. Based on the difference in these elevations and evidence of construction debris near the surface, it is suspected that this area was used for landfilling.

2.4 Current Regulatory Actions

2.4.1 Remedial Investigation

In accordance with the COA (Pennsylvania 2006), the Final Revised Remedial Investigation Work Plan (RIWP, Golder 2007), and the Revised Supplemental Investigation Work Plan (SIWP, Golder 2008b), Golder conducted a remedial investigation (RI) at the South Plant from 2007 to 2009.

The RI addressed 25 potential Areas of Concern (AOCs) as well as several general upgradient and downgradient locations at the Site to determine the presence or absence, nature, and extent of impacts to soil/historic fill, groundwater, surface water and sediment at or adjacent to the Site. Investigation activities included the following:

- Installation of 118 direct-push and hollow stem auger soil borings
- Excavation of 32 test pits
- Sampling of soil/historic fill from both the surface (0-2 feet) and subsurface (2-15 feet) zones
- Sampling of surface water and soil from Site drainage ditches
- Sampling of surface water and sediment from Mathay Run and the Old Erie Extension Canal
- Installation of two staff gauges in the Old Erie Extension Canal and one staff gauge in Mathay Run
- Installation of nine initial and three supplemental on-Site groundwater monitoring wells and the installation of two off-Site monitoring wells
- Collection of four rounds of groundwater samples from nine initial on-Site wells and collection of two rounds of groundwater samples from three supplemental on-Site wells, two new off-Site wells, and one existing off-Site well
- Slug testing of a select number of monitoring wells

- Performance of six synoptic rounds of water level measurements
- Surveys of the Site including topographic, property boundary, and soil boring/well locations
- Ecological Screening Assessment

The AOCs and RI samples locations are shown on Figure 2-2.

The results of these investigations were detailed in the March 1, 2010 Revised Remedial Investigation (RI) Report (Golder 2010a) and compared to the following criteria to identify the constituents of concern (COCs) at the Site:

Media	Screening Criteria
Soil/Historic Fill	Non-Residential Direct Contact Medium-Specific Concentrations (MSCs) and Non-Residential Used Aquifer (TDS ≤ 2500) Soil-to-Groundwater MSCs
Groundwater	Residential and Non-Residential Used Aquifer (TDS ≤ 2500) Groundwater MSCs
Surface Water	Pennsylvania Ambient Water Quality Criteria
Sediment	Ecological screening criteria

The RI Report (Golder 2010a) documented the presence of COCs above the Non-Residential Medium Specific Concentrations (MSCs) for soil/historic fill and above the Used Aquifer Residential MSCs for groundwater. The primary COCs that exceeded MSCs were lead in soil/historic fill and manganese in groundwater. A summary of COC exceedances by AOC is shown in Table 2-1.

The RI Report (Golder 2010a) was approved with comments by PADEP on March 31, 2010 (PADEP 2010). In its comments, PADEP requested plans for additional investigations/evaluations in the CWP (Golder 2011) to support the following assertions in the RI Report (Golder 2010a):

- Mathay Run is acting as a hydraulic barrier to movement of impacted groundwater off-Site
- Stormwater from AOC-S3 is not impacting the Old Erie Extension Canal
- Increased sediment concentrations at SS-S5 are related to off-Site anthropogenic sources and not related to Outfall OF1.

2.4.2 Public Involvement Program

As a follow up to PADEP's approval of the RI Report (Golder 2010a) and in accordance with the COA (Pennsylvania 2006) and the Land Recycling and Environmental Remediation Standards Act (Act 2), Trinity submitted a Notice of Intent to Remediate (NIR) the South Plant on April 14, 2010. The NIR provided a brief description of the property, the Site impacts, and the proposed remedial measures including remediating the Site to a combination of Background, Statewide Health, and/or Site Specific cleanup standards.

In accordance with Act 2, Trinity published a notice of the NIR in the Sharon Herald, initiating a 30-day public comment period, and submitted letters to the Borough of Greenville and Hempfield Township transmitting copies of the NIR and asking the community if they wanted to become involved in the development of the remediation and reuse plans for the Site. In response, both the Borough of Greenville and Hempfield Township requested involvement in the process, thereby initiating the Public Involvement Program for South Plant cleanup activities.

As a follow up to a May 10, 2010 email from the Eric Gustafson of PADEP and in accordance with Act 2 requirements (25 Pa. Code Section 250.5(b)) and PADEP guidance, Trinity developed a public involvement program to do the following:

- Provide local community members and interested parties in the vicinity of surrounding the South Plant property timely and accurate information about the Site and upcoming cleanup activities.
- Promote public involvement in ongoing Site activities and provide opportunities for all interested parties to provide input to the various phases of the cleanup process

As part of this process, Trinity developed the Public Involvement Plan (PIP, Golder 2010b) and solicited input and received approval for the document from representatives of Hempfield Township and the Borough of Greenville.

For the RI phase of the public involvement program, Trinity placed a copy of the March 1, 2010 Revised RI Report (Golder 201a) in local repositories for public review and comment, established a hotline for questions and/or comments, and held a public meeting on October 20, 2010 at Greenville High School to discuss the results of the RI Report and listen to any community concerns. Notices for these actions/events were published in both the Greenville Record Argus and the Sharon Herald. The comments/questions received during this phase of the public involvement program along with Trinity's responses to those questions/comments were documented in a Responsiveness Summary submitted to PADEP on December 21, 2010.

In the December 21, 2010 submittal, Trinity noted that the public comments/questions focused primarily on the future plans and/or redevelopment of the South Plant and none required changes to the March 1, 2010 Revised RI Report, and should not need to be resubmitted and re-approved by PADEP. At this time, Trinity also requested approval of the PIP (Golder 2010b) and Responsiveness Summary.

In a January 13, 2011 response (PADEP 2011a), noted that they had received Trinity's PIP (Golder 2010b), which would be included in the RI Report (Golder 2010a) submittal. In addition, PADEP acknowledged that because there were no public comments that would significantly change the content of the report, the RI Report (Golder 2010a) stood as approved by PADEP on March 31, 2010. This response concluded the RI phase of the project.

2.4.3 Cleanup Work Plan

At the conclusion of the RI phase of the project and in accordance with the COA (Pennsylvania 2006) and PADEP's comments, Trinity submitted a CWP (Golder 2011) for the South Plant to PADEP on March 25, 2011. The CWP included the following information:

- A summary of the nature and extent of impacts to soil/historic fill and groundwater at the South Plant that were above applicable Statewide Health Standards (SHSs)
- Proposed cleanup standards and preliminary response actions to address those impacts
- Pre-design investigations to address PADEP comments and support the remedial design.

The preliminary response actions are summarized in Table 2-2.

In accordance with the schedule and the PIP (Golder 2010b), Trinity placed copies of the CWP in the local repositories, published a notice in both the Greenville Record Argus and the Sharon Herald initiating a 30-day public comment period, and held a public meeting at Greenville High School on May 4, 2011 to discuss the preliminary response actions and listen to any community concerns.

In accordance with the COA and the PADEP approved schedule, Trinity submitted a Cleanup Work Plan (CWP, Golder 2011) to PADEP on March 25, 2011 that summarized the nature and extent of impacts to soil/historic fill and groundwater at the South Plant that were above applicable Statewide Health Standards (SHSs) and proposed preliminary cleanup standards and response actions, including pre-deign investigations, to address those impacts. In a letter dated June 7, 2011, PADEP approved the CWP with modifications (See Appendix A-1).

2.4.4 Cleanup Plan

In accordance with the COA and the PADEP approved schedule, Trinity submitted a Cleanup Plan (Golder 2012) to PADEP on January 12, 2012. PADEP deemed the Cleanup Plan (Golder 2012) administratively complete on January 30, 2012 and began its technical review of the plan.

In a letter dated April 27, 2012, PADEP noted that the Cleanup Plan was submitted in accordance with Act 2 and constitutes a Cleanup Plan as defined in Chapter 3, Section 304 of the Act. However, PADEP noted several deficiencies in the Cleanup Plan and disapproved it in accordance with the provisions of Act 2. A copy of that letter is included in Appendix A-2.

In response to the disapproval letter, Trinity and Golder met with PADEP on June 1, 2012 at its office in Meadville, Pennsylvania to discuss the comments, present preliminary responses, and agree to a path going forward for revising the Cleanup Plan for PADEP approval. As a follow up to this meeting, Golder, on behalf of Trinity, submitted a letter to PADEP on July 2, 2012 (see Appendix A-3) that formally

responded to PADEP's April 27, 2012 deficiencies/comments and detailed the agreed upon path going forward:

- Trinity will perform additional groundwater and surface water monitoring to demonstrate that Mathay Run is acting as a hydraulic barrier to impacted groundwater and that groundwater is not causing any exceedances of ambient water quality criteria. Assuming that both low flow and storm flow conditions occur, the additional surface water monitoring will be performed from July through October.
- PADEP will provide photographs and field notes related to the outfall the Department purportedly observed at the Site discharging to the Old Erie Canal Extension. If the photographs/notes clearly confirm a stormwater pathway from the Site to the Old Erie Extension Canal, Trinity will develop a sampling approach and will perform additional sediment evaluations.
- After the above monitoring/evaluations are complete, Trinity will prepare and submit a Revised Cleanup Plan for review and approval by PADEP. Assuming that the groundwater/surface water monitoring is performed in July and October, that there are no further sediment evaluations, and that there is no additional public comment period, Trinity anticipates submitting the Revised Cleanup Plan in January, 2013.
- In the interest of demonstrating continued progress at the South Plant, Trinity will perform appropriate construction permitting tasks in parallel with the preparation and submittal of the Revised Cleanup Plan.

In accordance with the June 1, 2013 agreements, Trinity installed additional monitoring wells and performed additional groundwater and surface water monitoring in September and November 2012 at the South Plant. The results of the additional groundwater and surface water monitoring are discussed further in Section 3.5 of this document. In addition, Trinity began the process of preparing construction related erosion and sediment control permits.

As a follow up to the July 2, 2012 letter, Trinity and PADEP had additional telephone discussions on October 18, 2012. During this call, PADEP representatives acknowledged that they were satisfied with a majority of Trinity's July 2, 2012 responses to deficiencies/comments; however, they still had concerns about the stormwater pathway from the Site to the Old Erie Extension Canal and potential Site impacts on sediments in the canal.

In response to PADEP's outstanding concern regarding potential impacts from stormwater discharges at the Site, Golder, on behalf of Trinity, conducted additional investigations of the stormwater drainage system in November 2012 including geophysics investigation on November 13, 2012 and sewer camera survey on November 20, 2012. Those investigations demonstrated that there was no direct stormwater discharge (outfalls) to the Old Erie Canal in the vicinity of the Site parking lot, as previously noted on a Site stormwater discharge permit as OF-1. The results of those investigations were conveyed to PADEP in a November 20, 2012 telephone call and are discussed in greater detail in Section 3.6 of this document.

On November 27, 2012, PADEP sent a letter to Trinity acknowledging the October 18, 2012 discussions and the additional investigations of the stormwater drainage system (see Appendix A-4). However, PADEP also noted that there were remaining concerns about the ultimate discharge points for the Site stormwater drainage system and requested that additional investigations be performed to determine the historic and current discharge points of the stormwater drainage system to demonstrate that these areas had been adequately characterized during the RI. In addition, PADEP requested that the results of these investigations be provided to the Department by December 18, 2012.

In response to PADEP's November 27, 2012 request, Trinity performed test pit investigations to verify the location and condition of the underground stormwater drainage system on December 12, 2012 and met with PADEP at the Northwest Regional Office in Meadville on December 18, 2012 to present those results. During the meeting, Trinity presented the results of the test pit investigations as well as historical documents that demonstrated that previously permitted stormwater outfalls (OF-1, OF-2, and OF-3) actually discharge to on-Site stormwater drainage ditches that were fully characterized during the RI for the Site. The results of the test pit investigations are discussed in greater detail in Section 3.6 of this document.

At the conclusion of the meeting, PADEP representatives acknowledged that Trinity's additional investigations satisfactorily demonstrated there are no direct stormwater discharges from the Site and noted that a PADEP Biologist had previously determined that the Site drainage ditches are not waters of the Commonwealth of Pennsylvania. Therefore, no further investigations or Ecological Risk Assessments are necessary to characterize the Site, and Trinity can proceed with revising the Cleanup Plan in accordance with comments provided by PADEP in an April 27, 2012 disapproval letter.

On December 21, 2012, Golder, on behalf of Trinity, submitted a letter providing a brief summary of the investigative work performed, confirming agreements during the meeting, and presenting an updated schedule for submitting a Revised Cleanup Plan for the Site. A copy of that letter is included in Appendix A-5.

3.0 PRE-DESIGN INVESTIGATION RESULTS

Based on the findings presented in the RI Report (Golder 2010a) and the response actions proposed in the CWP, the following pre-design field investigations were performed to support remedy evaluation, selection and design:

- Further characterization of soil/historic fill for disposal or containment design consideration in impacted areas and former disposal areas
- Stormwater drainage evaluation
- Vapor intrusion evaluation at AOC-S2
- Additional groundwater investigations

The field investigations were performed from July 26, 2011 through September 22, 2011. The pre-design investigation results are included in Appendix B and summarized below.

In response to comments from PADEP on the Cleanup Plan (Golder 2012), additional groundwater and surface water monitoring and additional stormwater drainage system investigations were performed at the Site. The additional monitoring and investigation results are included in Appendices J and K and summarized below in Sections 3.5 and 3.6, respectively.

3.1 Further Characterization of Soil/Historic Fill

3.1.1 Chemical Analyses

Based on the range of metals concentrations found in soil/historic fill during the RI, there was a potential that some impacted soil/historic fill could be characterized as hazardous based on toxicity characteristic leaching procedure (TCLP). Therefore' to further characterize soil/historic fill for waste management and disposal purposes 33 soil/historic fill samples from borings in impacted areas were collected and analyzed for the following parameters:

- RCRA metals, both total and TCLP
- Percent moisture, used to calculate total metals results
- Corrosivity (pH), only for samples collected in the former pickling area (AOC-S3) and former acid pond (AOC-S19)

In addition, a volatile organic compound (VOC) analysis was performed on a sample from AOC-S3 where dark staining and a petroleum-like odor was observed.

The TCLP results indicated the potential for materials to be hazardous due to the presence of lead above TCLP regulatory threshold at such time when the materials are excavated and managed on- and/or off-Site. Therefore, additional sampling/analysis will be necessary to characterize the excavated soil/historic fill as either RCRA hazardous or residual waste based upon levels of TCLP lead.

For Site cleanup activities, on-Site waste management will require separation, management, and off-Site disposal of any excavated materials that sampling confirms to be above the TCLP threshold for lead. If feasible, in-situ stabilization may be used to reduce the quantity of soil/historic fill potentially exceeding the TCLP threshold. The remaining soil/historic fill (i.e., those below the TCLP regulatory threshold) can then be managed as residual waste within on-Site containment areas consistent with the current Site remediation strategy.

In addition, the results also showed that corrosivity should not be an issue and also confirmed that elevated VOCs in specific areas within AOC-S3 may require additional management and/or disposal requirements during remediation.

3.1.2 Geotechnical Testing

For the remedial design of the former waste disposal areas, geotechnical parameters were needed for the existing soil/historic fill. Therefore, eight additional soil/historic fill samples were collected concurrently with the above described samples and tested for the following geotechnical parameters:

- Geotechnical index tests to assist with classification of the Site soil/historic fill, including:
  - Grain size, ASTM D422
  - Moisture content, ASTM D2216
  - Standard Proctor, ASTM D698
  - Direct shear testing for three points per sample, ASTM D2850

The results of these analyses have been incorporated into the design of the slopes and cap for the closure of the Former Disposal Areas,

3.2 Stormwater Drainage Evaluation

To better understand some of the surface water drainage patterns at the Site, visual inspections and dye tests were performed at two on-Site locations to achieve the following objectives:

Location	Reason
DT-S1 (a stormwater drain in the former parking area to the east of the former Main Office)	To observe if this area collects stormwater from the former operating areas around AOC-S3 and if it drains to the Old Erie Extension Canal
DT-S2 (a stormwater drain in AOC-S21)	To observe if stormwater from this area drains to the Western Drainage Ditch (AOC-S12)

The results of the stormwater evaluations showed that there is no evidence that DT-S1 and downstream Outfall OF1 are hydraulically connected to the Old Erie Extension Canal or other on-Site outfalls; therefore, it can be concluded that stormwater from the Former Operating Areas that drain to this location

do not discharge to the Old Erie Extension Canal. In addition, test results demonstrated that there is no hydraulic connection between DT-S2 and the Western Drainage Ditch or other on-Site outfalls.

3.3 Vapor Intrusion Evaluation at AOC-S2

Based on the initial vapor intrusion screening during the RI, there was a potential for risks to future on-Site workers from vapor intrusion. To further assess whether vapor intrusion is a potential issue and to decide if further response actions are necessary, sub-slab sampling with Summa canisters was performed at three locations within AOC-S2, the Former Paint Shop, that were proximate to the soil sample location that was above the initial vapor intrusion screening level. The Summa canister samples were analyzed for VOCs by USEPA Method TO-15.

In accordance with PADEP's vapor intrusion guidance, the sub-slab soil gas results were compared to Non-Residential Soil Gas MSCs. While the results showed that several VOCs were detected in soil gas samples, none were detected above their respective Soil Gas MSCs. Based on these results, there are no potential risks to workers from vapor intrusion into the building, and therefore, no further response actions are necessary.

3.4 Additional Groundwater Investigations

Additional groundwater investigations were performed to support the assertion in the RI Report that Mathay Run acts as a hydraulic barrier to groundwater impacts. These investigations included the installation and development of two additional shallow groundwater monitoring wells in July 2011 in the vicinity of Mathay Run and the former disposal areas. The wells were screened across the water table and are located in the following areas:

- MW-S13, south side of Mathay Run between wells MW-S6 and MW-S11
- MW-S14, hydraulically up-gradient of the disposal areas

In September 2011, water levels were measured both in the On-Site well network and at the Site surface water staff gauges and groundwater contours were developed. When the September 2011 water level measurements were compared to previous RI events, the results were consistent. In addition, the water level data measured in the vicinity of the former disposal areas was consistent with the assertion that Mathay Run is a hydraulic barrier, preventing COCs from reaching areas on the other side of the creek.

3.5 Additional Groundwater and Stormwater Monitoring

In response to PADEP comments on the Cleanup Plan, additional groundwater and stormwater monitoring was performed to support the assertion in the RI Report that Mathay Run acts as a hydraulic barrier to groundwater impacts and demonstrate that impacted groundwater and/or waste material from the Site is not adversely impacting surface water in the Old Erie Canal or Mathay Run. These field

investigations were designed and completed consistent with the discussions and agreements made during a June 1, 2012 meeting between representatives from Trinity, Golder and PADEP. The items discussed in that meeting were documented by Golder in the letter Response to Comments, Cleanup Plan - South Site - Disapproval (Response Letter) submitted to PADEP on July 2, 2012 (Appendix A-3) and included the following additional field investigation activities:

- Installing one additional monitoring well
- Installing one additional staff gauge
- Performing two additional groundwater monitoring events
- Performing two additional surface water monitoring events, one representing low flow conditions and the other after a storm event

The results of the additional groundwater and surface water monitoring activities are included as Appendix J and are summarized below.

On-Site monitoring activities began in September 2012 with the installation of a new monitoring well (MW-S15) and staff gauge (SG-4) and were completed in November 2012 after the second round of monitoring. The Site monitoring network consisted of the following:

- Fifteen on-Site groundwater monitoring wells (MW-S1 through MW-S15)
- Four staff gauges (SG-S1 through SG-S4) in both the Old Erie Canal and Mathay Run
- Six surface water sampling locations (SW-S1 through SW-S6) in both the Old Erie Canal and Mathay Run

An evaluation of the additional groundwater and surface water monitoring data concluded the following:

- Water levels measured in the vicinity of the former disposal areas, the Old Erie Canal, and Mathay Run were consistent with the assertion in the RI Report that the Old Erie Canal and Mathay Run are gaining streams and are acting as a hydraulic barrier to off-Site transport of COCs in groundwater under low flow and storm flow conditions.
- There is no correlation between groundwater concentrations in the vicinity of the former disposal areas and concentrations in wells across Mathay Run
- The observed correlation between higher manganese concentrations and low (e.g., negative) ORP values on both sides of a hydraulic barrier, Mathay Run, supports the RI Report assertion that manganese in soil/historic fill is being mobilized by reducing conditions in groundwater resulting from the degradation of organic materials in floodplain soils (alluvium)
- Total lead was the only exceedance of any applicable criteria for the COCs in the surface water samples including the background/upstream location for Mathay Run. Therefore, these lead exceedances appear to be related to urban stormwater runoff and not related to the Site.

- There are no exceedances of ambient water quality criteria of Site related COCs in either the Old Erie Canal or Mathay Run resulting from either direct discharge or diffuse groundwater flow from the Site

Based on these results, it was determined that no further groundwater or surface water investigations were necessary to determine the off-Site fate and transport of Site related COCs.

3.6 Additional Stormwater Drainage System Investigations

In response to PADEP comments on the Cleanup Plan, additional stormwater drainage system investigations were undertaken in November and December 2012 that focused on the eastern portion of the Site. These additional field investigations were designed and completed consistent with the discussions and agreements made during a June 1, 2012 meeting (see Appendix A-3) and an October 18, 2012 conference call between representatives from Trinity, Golder and PADEP, as well as requirements identified in a November 27, 2012 letter from PADEP (See Appendix A-4).

The additional stormwater drainage system investigations included the following tasks performed by subcontractors under Golder oversight:

- Geophysical survey
- Camera inspection
- Test pit investigation

The key objectives of these investigations were to identify stormwater drainage system features, if they existed, between the OF1 catch basin and the Old Erie Canal, and to identify the discharge location for the pipe draining the OF1 catch basin. The results of the additional stormwater drainage system investigations are included as Appendix K and are summarized below.

3.6.1 Summary of Investigations

On November 13, 2012, Grumman Exploration, Inc. (Grumman) performed a geophysical survey using ground-penetrating radar (GPR), electromagnetic conductivity profiling (EM) and a metal detector. For this work, Grumman looked for possible subsurface anomalies between the OF1 catch basin and the Old Erie Canal, and then between OF1 and OF2. Based on field interpretations of the geophysical measurements, Grumman spray-painted the ground surface to mark-out inferred subsurface features. It should be noted that the geophysical survey identified subsurface anomalies that appeared to be a subsurface drain running south from OF1 towards a drain and outlet near OF2; however, there was a significant data gap in the vicinity of the former manufacturing buildings.

Based on the geophysical survey results and in an attempt to determine the location and the condition of the entire length of stormwater drain between OF1 and the outlet near OF2, a camera inspection was

conducted on November 20, 2012. Blood Hound Inc. (Blood Hound), a subsurface utility consulting company, used a mechanized, fiber-optic pipe camera equipped with video to inspect the pipe draining the OF1 catch basin. However, the camera was blocked by sediment several feet downgradient from OF1. In addition, Blood Hound personnel inspected the outlet pipe near OF2 to determine if a camera could be used to inspect the pipe from that location; however, they found that outlet to be almost completely blocked with sediment.

Based on the geophysical survey and camera inspection results and in response to the November 27, 2012 letter from PADEP, a test pit investigation was conducted on December 12, 2012. SJB Services, Inc. (SJB) excavated the test pits with a backhoe. SJB is a Pennsylvania-licensed driller based in Hamburg, New York and they have previously provided subsurface exploration services for other Site investigations.

Based upon the geophysical survey results as well as the 1995 site sketch and 1997 discharge permit renewal application, Golder directed SJB to excavate twelve test pits in specific locations. During the excavations, Golder made visual subsurface observations without entering the excavations. The test pit locations were selected to determine the following:

- Confirm the geophysical survey results that identified no subsurface drainage features between the OF1 catch basin area and the Old Erie Canal
- Ascertain the direction and discharge of stormwater flow from the OF1 catch basin, including:
  - Uncovering the possible eastern pipe that headed south towards the OF2 area
  - Uncovering the possible western pipe that headed southwest
- Uncover the possible stormwater drain pipe (P1) identified at the pipe outlet (east of OF2) that headed east then curved north in the direction of OF1, which aligned with several approximately 1-foot to 2-feet deep holes in the ground surface
- Establish if a stormwater drain pipe connected the OF1 and OF2 areas

Additional test pits were also excavated to determine the following:

- Identify if there was a visually obvious subsurface feature where inconsistent GPR reflections were observed west of P1 that Grumman suggested may be a possible feeder drain or backfilled swale
- Understand if the above feature connected P1 to the component of the storm sewer system that drained the portion of the Site that ultimately discharged at OF2
- Identify if there was a visually obvious subsurface feature where the deeper, strong GPR reflections were observed in the OF2 area

3.6.2 Investigation Conclusions

The following conclusions were derived from the stormwater drainage system investigations:

- The RI Report location showing OF1 directly discharging into the Old Erie Canal was incorrect and was a legacy location based in part on a historic Site figure submitted with a 1997 Site permit application
- OF1 was shown as specifically not discharging directly into the Old Erie Canal on a figure submitted with a 1993 Site permit application
- Field investigations were conducted to clarify the location of OF1 and its point of discharge, and they included visual inspections, dye tests, a geophysical survey, a camera inspection, and a test pit investigation
- The OF1 catch basin was shown to be connected to the drainage ditch near OF2 with a buried 18-inch concrete stormwater drain
- In general, water draining into OF1 no longer discharges at the pipe outlet due to fractures in the 18-inch stormwater drain
- No evidence was found of any stormwater drainage system feature draining the former Site production areas with a discharge directly into the Old Erie Canal

The field investigation results and above conclusions were presented by representatives of Golder and Trinity to PADEP at a meeting on December 18, 2012. Based on the information provided, PADEP stated they were satisfied the field investigations showed stormwater from former Site production areas did not discharge directly into the Old Erie Canal.

4.0 SELECTED CLEANUP STANDARDS AND RESPONSE ACTIONS

Trinity will be performing response actions for all impacted areas at the Site. Based on PADEP's April 27, 2012 comments on the Cleanup Plan (see Appendix A-1) and the results of subsequent additional investigations and discussions, the selected cleanup standards and response actions presented in the Cleanup Plan have been revised.

As noted in the Revised RI Report (Golder 2010) and further demonstrated by the July 2, 2012 Response Letter (Appendix A-3), on-Site soils consist of a mixture of native material and grading fill. Figure 1A of this letter shows a clear distinction between grading fill used to level the Site for development and the historic disposal areas (i.e., waste process sand disposal area and the Old Ballfield area). Furthermore, Figure 1B of this letter shows the proposed excavation areas from the Cleanup Plan in relation to the types of fill encountered at the Site. This figure shows that both the historic grading fill and former disposal areas have been investigated and that releases within the historic grading fill have been identified and delineated. Therefore, for this Revised Cleanup Plan the cleanup standards and response actions for soil/historic grading fill and former disposal areas have been addressed separately to highlight this distinction.

The selected cleanup standards and response actions are summarized in Table 4-1 and described in more detail in Sections 4.1, 4.2, 4.3, and 4.4 below.

4.1 On-Site Soil/Historic Fill

The selected response actions for soil/historic fill are generally defined as areas impacted by metals, primarily lead, areas impacted by VOCs, and other areas. The areas and response actions are described in more detail below.

4.1.1 Lead Impacted Areas

Areas with primarily lead impacted soil/historic fill were grouped into two categories based on their former and/or current use, location, and likely response action requirements.

- Former Operating Areas
- Drainage Ditch/Surface Water Pathway Areas

For the purposes of this Revised Cleanup Plan, the preliminary extents of these areas were defined by the following screening criterion:

- Lead in soil/historic fill greater than the Non-Residential Soil-to-Groundwater MSC (450 mg/kg), which is also the Pennsylvania Clean Fill Criteria

While these areas had exceedances for other COCs, lead was the most common COC and either lead impacts or the physical limits of disposal generally define the affected soil/historic fill areas for all COCs.

4.1.1.1 Former Operating Areas

The Former Operating Areas with lead impacted soil/historic fill include the following AOCs:

- AOC-S3 (Former Pickling Area),
- AOC-S21 (Former Plate Painting Yard (current South Yard)),
- AOC-S19 (Former Acid Filter Drainage Pond),
- AOC-S6A (Boiler/Power House-East Side)
- AOC-S6B (Boiler/Power House-North Side).

AOC-S3 was historically used for surface preparation and painting of steel including sandblasting, pickling (sulfuric & phosphoric acid baths), painting, & drying areas. There is no documentation of the formal closure of the pickling area. Adjacent AOC-S21 was reportedly used for staging and painting of steel. There is also no documentation of the formal closure of the painting area.

AOC-S19 was historically used as a drainage pond for the disposal of spent pickling acid from approximately 1937 to 1970. There is no documentation of the formal closure of the acid filter drainage pond.

AOC-S6A was historically used for storage of coal and was the location of transformers. AOC-S6A is located adjacent to AOC-S3. Lead exceedances in surface soil/historic fill are likely the result of cross-contamination from the painting/pickling area. Nearby AOC-S6B was reportedly the location of a former partially buried 15,000 gallon fuel oil storage tank. The single lead exceedance in surface soil/historic fill may be related to paint from the exterior of the former tank or it may simply be an analytical/sampling outlier.

In addition, the pre-design investigation results identified several soil/historic fill samples within the Former Operating Areas that exceeded the TCLP threshold for lead. For these impacted soils/historic fill, Trinity proposes to meet the following cleanup standard:

- Site Specific Standard of pathway elimination through excavation of impacted soil/historic fill and capping, as necessary, if all impacted soil/historic fill cannot be removed

To achieve this cleanup standard, Trinity proposes the following response actions:

- Excavate soil/historic fill in the areas exceeding 450 mg/kg to the water table
- Perform post-excavation sampling to confirm adequate removal prior to backfill

- Characterize the excavated soil/historic fill for purposes of determining appropriate disposal options. Excavated soil/historic fill exceeding the TCLP threshold for lead will be disposed off-Site at a permitted facility. All other excavated soil/historic fill will be used as grading material in the Former Disposal Areas and contained on-Site
- Backfill with clean fill and pave with asphalt

For these response actions, other potentially Applicable or Relevant and Appropriate Requirements (ARARs) include the following:

- Pennsylvania Solid Waste Management Act of 1980 for removal of the non-media solids and pathway elimination under any one or a combination of Act 2 standards for soils outside the perimeter of the closure area
- RCRA hazardous waste disposal requirements, as appropriate, based on waste characterization
- Pennsylvania Clean Streams Law for response actions to minimize erosion and sedimentation in conformance with the requirements of PA 25 Chapter 102 - Erosion and Sediment Control

4.1.1.2 Drainage Ditch/Surface Water Pathway Areas

The Drainage Ditch/Surface Water Pathway Areas include two drainage ditches (AOC-S12, the Western Drainage Ditch; and AOC-S18, the Southern Drainage Ditch) and general downgradient areas in the southwestern corner of the Site in the vicinity of SB-S1 and SB-MW10. AOC-S12 drains the western areas of the Site and is connected hydraulically to roof drains in the Former Operating Areas.

Stormwater from the Western Drainage Ditch flows through the southwestern downgradient areas of the South Plant before entering another drainage ditch leading to Mathay Run. In addition, these areas were subject to flooding and may have been filled during stormwater re-routing in the 1950s and 1970s.

AOC-S18 drains the southeastern and southern portions of the Site and well as the Former Disposal Areas. Stormwater from the Southern Drainage Ditch flows along the southern boundary of the Site and then between the Former Disposal Areas before leading to Mathay Run

For impacted soil/historic fill in these areas, Trinity proposes to meet the following cleanup standard:

- Site Specific Standard of pathway elimination through excavation of impacted soil/historic fill

To achieve this cleanup standard in the Drainage Ditches, Trinity proposes the following response actions:

- Remove soil/historic fill in the areas exceeding the 450 mg/kg lead concentration
- Perform post-excavation sampling to confirm adequate removal
- Re-grade as necessary to promote positive drainage

- Characterize the excavated soil/historic fill for purposes of determining appropriate disposal options. Excavated soil/historic fill exceeding the TCLP threshold for lead will be disposed off-Site at a permitted facility. All other excavated soil/historic fill will be used as grading material in the Former Disposal Areas and contained on-Site

To achieve this cleanup standard in the downgradient areas, Trinity proposes the following response actions:

- Excavate soil/historic fill in the areas exceeding the 450 mg/kg lead concentration to the water table
- Perform post-excavation sampling to confirm adequate removal prior to backfill
- Characterize the excavated soil/historic fill for purposes of determining appropriate disposal options. Excavated soil/historic fill exceeding the TCLP threshold for lead will be disposed off-Site at a permitted facility. All other soil/historic fill will be used as grading material in the Former Disposal Areas and contained on-Site
- Backfill with clean fill to surrounding grade

For these response actions, other potential ARARs include the following:

- Pennsylvania Solid Waste Management Act of 1980 for removal of the non-media solids and pathway elimination under any one or a combination of Act 2 standards for soils outside the perimeter of the closure area
- RCRA hazardous waste disposal requirements, as appropriate, based on waste characterization
- Pennsylvania Clean Streams Law for response actions to minimize erosion and sedimentation in conformance with the requirements of PA 25 Chapter 102 - Erosion and Sediment Control

4.1.2 VOC Impacted Areas

The VOC impacted soil/historical fill areas are limited to subsurface soil/historic fill in AOC-S2 (Former Paint Shop) and surface and subsurface soil/historic fill in AOC-S3 (Former Pickling Area). AOC-S2 was formerly used for abrasive blasting, railcar painting and drying, new paint storage, and used paint and solvent storage. Painting in this area was performed in closed engineered booths with concrete floors and air filtration systems. Results of the RI demonstrated that there were no VOC exceedances of the SHS; however, there were exceedances of USEPA-PA Defaults Non-residential Volatilization to Indoor Air Screen screening values. Nevertheless, sub-slab sampling during the pre-design investigations showed that no VOCs were detected above their respective Soil Gas MSCs. Therefore, no further response actions are necessary for this area.

As stated above, AOC-S3 was reportedly used for surface preparation and painting of steel including sandblasting, pickling (sulfuric & phosphoric acid baths), painting, and drying. In AOC-S3, VOC impacts were limited to surface and subsurface soil/historic fill in the vicinity of SB-S9. In this area there were

exceedances of the applicable soil-to-groundwater MSCs as well as exceedances of USEPA-PA Defaults Non-residential Volatilization to Indoor Air Screen screening values.

VOC impacted surface and subsurface soil/historic fill in the vicinity of SB-S9 in AOC-S3 will be addressed as part of response actions for the lead impacted areas described above for this area in order to eliminate the potential for vapor intrusion.

For VOC impacted soil/historic fill areas, Trinity proposes to meet the following cleanup standard:

- Site Specific Standard of pathway elimination through excavation of impacted soil/historic fill and capping, as necessary, if all impacted soil/historic fill cannot be removed

To achieve this cleanup standard, Trinity proposes the following response actions:

- Excavate soil/historic fill in the areas exceeding VOC Soil to Groundwater MSCs to the water table
- Perform post-excavation sampling to confirm adequate removal prior to backfill
- Characterize the excavated soil/historic fill for purposes of determining appropriate disposal options
- Backfill with clean fill and pave with asphalt

For these response actions, other potential ARARs include the following:

- Pennsylvania Solid Waste Management Act of 1980 for removal of the non-media solids.
- RCRA hazardous waste disposal requirements, as appropriate, based on waste characterization

4.1.3 Other Areas

The other areas include the following AOCs and general upgradient soil/historic fill locations where there were either no exceedances, only surface exceedances of the soil-to-groundwater MSC for manganese, subsurface exceedances of the 1/10th soil-to-groundwater MSC for arsenic and manganese, or very limited exceedances of soil-to-groundwater MSC for other COCs:

AOC	Description
AOC-S5	Transformer Areas
AOC-S8	Former Paint Shop (also former RCRA tank storage area)
AOC-S9	Former Forge Shop and Waste Paint Storage Room (northwest corner of Forge Shop)
AOC-S10	Former Paint Shop
AOC-S13	Maintenance Building (former Machine Shop) Chemical/Waste Storage Area and Former 1,000 gallon gasoline storage tank located on north side of building)
AOC-S14	Production Building North Chemical/Waste Storage Area

AOC	Description
AOC-S15	Production Building South Chemical/Waste Storage Area
AOC-S16	Transformer Area West Side of Production Building
AOC-S20	Former Incinerator (also former RCRA 55 gallon drum storage area)
AOC-S22	Former 15,000 Gallon Fuel Oil Above Ground Storage Tank
AOC-S23	Railroad Switches (SB-26 & SB-27)
AOC-S24	Former Above Ground Storage Tanks (Two 23,000 Gallon Fuel Oil Tanks)
AOC-S25	Former Underground Storage Tanks (10,000 Gallon Fuel Oil Tank, 5,000 Gasoline Tank)
General Upgradient Conditions	Up-gradient/Non-operational Area/Potential Impacts from Off-Site (Northwest area near MW-S3)"
General Upgradient Conditions	Up-gradient/Non-operational Area/Potential Impacts from Off-Site (Northeast area near MW-S4)

For these other areas, the soil/historic fill are currently below one or both of the following criteria and there are no specific indications of releases:

- Statewide Health Standard for Non-Residential Soils (either directly or by utilizing the 75 percent/10x Rule attainment test described in 25 PA Code §250.707(b) and Section IV.B of the TGM (PADEP, 2002))
- Pennsylvania Clean Fill criteria.

Therefore, no further response actions are planned for these areas. However, Trinity may perform a residual risk assessment after all other Site response actions have been completed to: 1) demonstrate that the remaining soil/historic fill meets a risk-based numeric standard for non-residential use, and 2) obtain relief from liability for these areas under Act 2.

4.2 Former Disposal Areas

The Former Disposal Areas include AOC-S1 ("Old Ballfield"), AOC-S11 (Debris/Fill Area Adjacent to AOC-S1), and AOC-S17 (Sandblast Sand Fill Area). These areas were all reportedly used for waste disposal, all three of these areas may have received waste after September 7, 1980, and none were formally closed in accordance with applicable solid waste management regulations.

For the purposes of this Revised Cleanup Plan, the preliminary extents of these areas were defined by the apparent limits of former disposal areas based on current Site topography and soil test pit logs. While surface soil impacts were not observed over these entire areas, the entire areal extents of the disposal areas are considered for cleanup because they were never formally closed. In addition, the pre-design investigation results showed that two locations within AOC-S11, had soil/historic fill that exceeded the TCLP threshold for lead.

For these former disposal areas, Trinity proposes to meet the following cleanup standard:

- Site Specific Standard of pathway elimination through capping of the former disposal areas.

To achieve this cleanup standard, Trinity proposes the following response actions:

- Excavate the soil and waste material exceeding the TCLP threshold for lead for off-Site disposal at a permitted facility
- Re-grade to promote positive drainage and contain within a Residual Waste Landfill Cap
- Install Site access controls
- Apply deed restrictions through a Universal Environmental Covenant to prohibit excavation in the capped areas
- Perform long-term maintenance & cap integrity monitoring

For these response actions, other potential ARARs include the following:

- Pennsylvania Solid Waste Management Act of 1980 for closing in place
- RCRA hazardous waste disposal requirements and/or Subtitle C closure requirements, as appropriate, based on waste characterization
- Pennsylvania Clean Streams Law for response actions to minimize erosion and sedimentation in conformance with the requirements of PA 25 Chapter 102 - Erosion and Sediment Control.

4.3 Groundwater

While Site-wide manganese concentrations and localized arsenic exceed the Used Aquifer Non-Residential MSCs, there is an incomplete pathway for exposure to dissolved manganese and arsenic in groundwater because there are no known downgradient overburden wells and because pre-design investigation results and additional groundwater and surface water monitoring results confirm that Mathay Run is acting as a hydraulic barrier. However, because on-Site concentrations of manganese and arsenic in groundwater exceed the Used Aquifer SHSs, further response actions are proposed to demonstrate compliance with Act 2.

For groundwater, Trinity proposes to meet the following cleanup standards at the downgradient Site boundaries:

- Background cleanup standard for manganese and arsenic
- Residential Used Aquifer MSCs for all other COCs

To achieve these cleanup standards, Trinity proposes the following response actions:

- Trinity will develop a background standard for manganese and arsenic in accordance with PA 25 §250.707(a)(3). At a minimum, Trinity will use 12 samples from a

combination of monitoring wells, including upgradient locations at the South Plant and other off-Site locations unaffected by any potential South Plant or North Plant releases to groundwater, to determine background concentrations in groundwater

- Perform eight quarters of additional groundwater monitoring and surface water monitoring at select locations to continue to demonstrate the presence of an effective hydraulic barrier that intercepts impacted groundwater off-Site and demonstrate compliance with both groundwater standards and Pennsylvania Clean Streams Law for any groundwater discharges to waters of the Commonwealth
- Apply deed restrictions through a Universal Environmental Covenant to prohibit on-Site use of overburden groundwater

For these response actions, other potential ARARs include the following:

- Local Municipal Drinking Water Ordinances

4.4 Sediment

Sediment results from both Mathay Run and the Old Erie Extension Canal have indicated exceedances of the USEPA Region 3 BTAG Freshwater Sediment Benchmarks for several SVOCs, pesticides, and metals. However, the sediment benchmarks are screening criteria and not cleanup standards. While exceedances of the screening criteria indicate there is a potential risk to aquatic biota, they do not trigger sediment cleanup actions without additional consideration.

During the RI, a number of exceedances were also found in upstream samples of both Mathay Run and the Old Erie Extension Canal. Based on the distribution and concentrations of these COCs found in sediment, the COCs appear to be related to point source and non-point source (e.g., stormwater) discharges, primarily off-Site, although some of which may be related to the Site operations.

Several historic Site figures and NPDES permit documents had shown an outfall named OF-1 located to the east of the Main Office/former parking area and discharging to the Old Erie Extension Canal. Based on the location of this outfall in relation to sediment sample SS-S5, PADEP had requested additional investigations to determine if there was a link between impacts in the Former Operating Areas and COCs in the sediment of the Old Erie Extension Canal.

In response to PADEP's request, Golder performed a Site inspection in March 2011 when vegetation was not thick and did not find an outfall pipe in this area. In addition, Golder performed a stormwater drainage evaluation in July 2011 as part of the pre-design investigations. During the drainage evaluation, dye was discharged to a stormwater drain (DT-S1) in the former parking area that was believed to discharge directly to outfall OF-1 and the Old Erie Extension Canal. However, dye was not seen entering the Old Erie Extension Canal, Mathay Run, or any other locations on-Site. In addition, on-Site observations during the dye tests showed that the outlet pipe from DT-S1 drains to a manhole directly east of OF-1 that redirects the flow to the south and not to the towards the Old Erie Extension Canal.

Because there are no known records of outfall OF-1 being removed from this location, it is possible that the outfall location was errantly marked on historic records, with the error perpetuated on subsequent documents. Based on the field observations, outfall OF-1 is likely the observed manhole and stormwater from the Site operational areas does not discharge into the Old Erie Extension Canal.

In its Response Letter (Appendix A-3), Trinity noted that sediment exceedances were similar for both upgradient and downgradient locations and provided additional information that supported the position the sediment COCs are related to urban stormwater runoff from eastern Greenville since 1975 and that the high COC levels observed in SS-S5 appear to be related to the effects of a heavily vegetated sediment deposition. Furthermore, Trinity performed additional stormwater drainage investigations the Site in November and December 2012 (see Appendix K) that satisfactorily demonstrated to PADEP there are no direct stormwater discharges from the Site.

Therefore, it is concluded that observed exceedances in sediment are not related to Site activities and thus no further response actions are necessary for sediment.

5.0 ENGINEERING DESIGN

In support of this selected soil/historic fill, disposal area, and groundwater response actions, a detailed engineering design has been performed that includes the following:

- The following design narrative explaining how the selected remedial alternatives address impacted soil/historic fill above action levels and satisfies the hazardous waste regulations for off-Site disposal and residual waste regulations for closure of the Former Disposal Areas.
- The attached design drawings showing the detailed layout and design details to obtain permit-level approval of the selected remedy
- Technical specifications, following Construction Specification Institute (CSI) format, for the selected response actions (see Appendix C)
- Design calculations supporting the use of the proposed materials (e.g. slope stability, stormwater management, etc.) (see Appendix D)
- A Groundwater, Surface Water, And Storm Water Monitoring Plan (Appendix E)
- A Construction Quality Assurance (CQA) Plan (see Appendix F)
- Stabilization/Fixation Technology Information (See Appendix L)

Further response actions were identified for the Site based on: 1) exceedances of lead and other COCs in soil/historic fill, 2) former disposal areas that were not formally closed, and 3) exceedances of arsenic and manganese in groundwater. The selected response actions include the following remedial activities:

- Treatability Testing
- Soil/historic fill excavation, waste management, and backfilling
- On-Site containment
- Cap maintenance and monitoring
- Surface water management
- Groundwater/surface water monitoring
- Deed restrictions/land use controls

The layout of the proposed remedy is shown on Drawing 3 and the following sections describe the engineering design as well as the technical specifications, construction sequence, and construction quality assurance requirements for these remedial activities.

5.1 Treatability Testing

Based on the range of lead concentrations found in soil/historic fill during the RI and the results of the pre-design investigation (Appendix B), it is possible that some of the material with the highest total lead concentrations could, if generated and analyzed, potentially be characterized as hazardous waste based on toxicity characteristic leaching procedure (TCLP) testing. For this soil/historic fill, Trinity is proposing in-situ pre-conditioning with stabilizing agents to render them non-hazardous and amenable for off-Site

disposal. For metals impacted soil/historic fill there are several stabilizing agents (i.e., Portland cement, fly ash, EnviroBlend®, etc.) that have successfully been used to reduce the leachable fraction of lead in soil/historic fill below the TCLP limit of 5 mg/l (see Appendix L). To select an effective stabilizing agent/mixture ratio for the Site soil/historic fill, bench-scale treatability testing will be performed on soil/historic fill from several areas of the Site where pre-conditioning is being proposed prior to construction mobilization.

5.2 Soil/Historic Fill Excavation, Waste Management, and Backfilling

5.2.1 Excavation

For the soil response actions, impacted soil/historic fill will be excavated to the extent and depths shown on Drawing 4 and post-excavation sampling will be performed to confirm that the remaining soil/historic fill is at or below the screening criteria (450 mg/kg lead) as well as the VOC soil to groundwater MSCs as required for the VOC impacted areas.

For areas with total lead concentrations exceeding 1,000 mg/kg, soil/historic fill will be pre-conditioned in-situ with a stabilizing agent (Portland cement, fly ash, EnviroBlend®, etc.) in 1-2 foot lifts using an excavator or other mechanical means to mix the soil/historic fill and stabilizing agent prior to excavation.

Where post-excavation sampling shows soil/historic fill levels above the cleanup standards, additional excavation will be performed. In areas where proposed excavation depths are at or beyond existing groundwater levels, soil/historic fill will be pre-conditioned in-situ with stabilizing agents, as necessary, to render them non-hazardous and left in place.

5.2.2 Waste Management

In accordance with Pennsylvania Solid Waste regulations and RCRA requirements, excavated soil/historic fill will be characterized for waste management purposes. Based on the pre-design investigation (Appendix B), some of the on-Site impacted soil/historic fill may have to be managed as hazardous waste based on potential results of toxicity characteristic leaching procedure (TCLP) testing. Approximately 30 percent of the soil/historic fill sampled in the Former Operating Areas and Former Ditch/Surface Water Pathway Areas were over the TCLP toxicity criteria for lead (5 µg/l). In addition, two adjacent samples in the Former Disposal Areas were over the criteria as well.

For design purposes, the following assumptions have been made:

- Approximately 30 percent of the impacted soil/historic fill in the Former Operating Areas and the Drainage Ditch/Surface Water Pathway Areas will be managed as hazardous waste and disposed off-Site at an appropriately permitted facility, and the remaining 70 percent will be managed as residual waste and be placed in the Former Disposal Areas.

- The area in the Former Disposal Area around the two adjacent samples with failing TCLP results will be excavated and managed as hazardous waste and disposed off-Site at an appropriately permitted facility as well.

Based on these assumptions, the majority of the impacted soil and materials in the Former Disposal Areas will be characterized and regulated as residual waste. Consequently, the Former Disposal Areas will be closed in accordance with Pennsylvania residual waste regulations and the non-hazardous impacted soil/historic fill from the other areas of the Site will be used as "general fill" for those disposal areas prior to their closure.

5.2.3 Backfilling

After completion of excavation and after post-excavation sampling results for each soil/historic fill Response Action area shows COC levels are at or below cleanup standards, backfill operations (backfill and ISS in relevant areas) will commence at each of the remedial areas as described below.

Area	Backfill Requirements
Former Operations Areas	Excavations in these areas will be backfilled with clean fill material, compacted and paved as shown on Drawings 5 and 6.
Drainage Ditch/Surface Water Pathway Areas	For the Western and Southern drainage ditches, the top surface will be re-graded, as necessary, to maintain positive drainage. For the general downgradient areas SW1 and SW2, the excavations will be backfilled with clean fill material, compacted, and vegetated as shown in Drawings 5 and 6.
Former Disposal Areas	Excavation areas within the disposal area will be backfilled with impacted soil/historic fill from the other On-Site areas, compacted, capped with a geosynthetic cover system, and vegetated as shown on Drawing 7.

5.3 On-Site Containment

In accordance with the Pennsylvania Solid Waste Management regulations, the Former Disposal Areas will be closed as a residual waste landfill. The cap system and cap design are described below:

5.3.1 Cap System

The cap system will include the following major elements (from top to bottom):

- 6-inch thick vegetative support layer
- 1.5-feet thick cover soil layer
- Geocomposite drainage layer (consisting of a high density polyethylene (HDPE) geonet with a non-woven geotextile on the top and bottom (double-sided)

- 40-mil (nominal) thick linear low density polyethylene (LLDPE) or HDPE geomembrane liner
- 10 ounce per square yard nonwoven geotextile
- 6-inch thick sub-base soil grading layer
- Prepared subgrade layer

5.3.1.1 Vegetative Support Layer

A minimum of 6-inch thick layer of soil capable of sustaining vegetation will be placed over the cover soil layer, seeded and fertilized to establish a vegetative cover that will help reduce erosion of the cap. Placement of the vegetative support layer and materials used within this layer will be in accordance with Specification Section 02235 (Appendix C).

5.3.1.2 Cover Soil

A minimum cover soil of 1.5 feet will be placed over the geocomposite drainage layer. The cover soil shall be placed directly over the geocomposite in two compacted lifts (total compacted cover soil 18-inches). The first lift shall be a minimum compacted thickness of 12-inches and the second lift shall be a minimum compacted thickness of 6-inches. The cover soil will be compacted in accordance with Specification Section 02223 (Appendix C).

5.3.1.3 Geocomposite Drainage Layer

Geocomposite drainage layer consisting of a high density polyethylene (HDPE) geonet in the middle (geonet core) with nonwoven geotextile on top and bottom (double-sided) will be placed above the geomembrane to provide filtration and lateral drainage of infiltrated precipitation allowing minimal leakage of stormwater into the geomembrane layer. Placement of geocomposite on-Site shall be in accordance with Specification Section 02418 (Appendix C).

5.3.1.4 Geomembrane Layer

The geomembrane layer will be an approved 40-mil thick textured LLDPE or HDPE geomembrane meeting or exceeding the required material properties specified in Specification Sections 02597 and 02598 (Appendix C), respectively. The geomembrane will be placed on top of a geotextile layer.

5.3.1.5 Geotextile Layer

The geotextile layer will be an approved 10 ounce per square yard nonwoven geotextile meeting or exceeding the required material properties specified in Section 02595 of the Specifications (Appendix C). The geotextile will be placed on top of at least a 6-inch thick layer of grading fill.

5.3.1.6 Grading Fill Layer

A minimum of 6-inch thick grading fill layer will be placed above the re-graded subgrade layer and will have similar properties as the cover soil. Laboratory tests will be performed on the grading fill to confirm

that the material meets the requirements for the fill in accordance with Specification Section 02223 (Appendix C).

5.3.1.7 Prepared Subgrade Layer

The existing material and relocated impacted soil/historic fill from the on-Site excavation areas layer will be re-graded, as necessary, prior to placement of sub-base layer and the geosynthetics. The subgrade layer will be prepared in accordance with Specification Section 02223 (Appendix C).

5.3.2 Cap Design

For the cap design, the following engineering analyses were performed:

- Global Slope Stability
- Veneer Stability
- Settlement
- Bearing Capacity
- Frost Penetration
- Infiltration
- Drainage Layer

The analyses are described below and the supporting calculations are included as Appendix D.

5.3.2.1 Global Slope Stability

The proposed grading for the disposal area shown on Drawing 7 was evaluated for global slope stability by a limiting equilibrium method of analysis, using the Reinforced Slope Stability Analysis (ReSSA) software package. A global slope stability analysis was performed to evaluate the minimum factor of safety (FS) for stability using an assumed worst case slope configuration corresponding to the steepest allowable final cover slopes of 33 percent. This worst case slope configuration is located along the western edge of the cap, along the relocated diversion channel (stormwater basin area), which is shown as Cross Section B-B' on Drawing 8. A stability analysis was also performed on the geosynthetic cap system having the greatest fill thickness of approximately 10 feet thick and a slope of 3 percent shown as Cross Section C'-C on Drawing 7.

Stability analysis was performed on Cross Section B-B' and C'-C, for static conditions and checked against a minimum long term factor of safety of 1.5 against rotational and translational slope stability analysis methods, using an equipment load of 713 pounds per square foot (psf) (equivalent ground pressure). The analysis was performed using material properties for native soil, non-hazardous excavated soil/historic fill from other areas (relocated soil/historic fill), grading fill, geosynthetic cap, and

cover soil material. The analysis also included the effect of on-Site groundwater assuming groundwater at an elevation of 934 feet above msl.

The results of the global slope stability analyses indicate that a long term factor of safety of greater than 1.5 was achieved against rotational and translational slope stability analysis for static conditions under an applied equipment load (equivalent ground pressure) of 713 psf. It was concluded from the global stability analyses that the stormwater basin (represented by the steepest cross section B-B') and the geosynthetic cover system placed over the relocated soil/historic fill within the disposal area (represented by the cross section C'-C) will remain stable under the interpreted subsurface conditions and under an operating equipment load. The factor of safety values obtained against rotational and translational slope stability analyses were 1.68 and 11.58 for cross section B-B' (3H:1V slope) and 2.38 and 13.2 for cross section C'-C (33H:1V slope) respectively which are greater than the minimum long term factor of safety of 1.5.

5.3.2.2 Veneer Stability

Veneer stability was performed to evaluate the stability of the proposed final cover placement over the relocated excavated materials in the Former Disposal Areas. The target factors of safety against veneer instability of the cover were 1.5, 1.3, 1.0 and 1.3 against static (gravitational), construction, seismic and seepage build up loading, respectively. The analysis showed that the minimum interface shear strength to satisfy veneer stability can be achieved through use of materials exhibiting a strength represented by an equivalent interfacial friction angle of 27 degrees and no adhesion. Based on these parameters, textured geomembrane HDPE or LLDPE geomembrane may be utilized. Prior to installation, friction testing verification will be required for the selected cap geosynthetic and soil materials.

5.3.2.3 Settlement

The proposed cap section was analyzed for its ability to withstand the development of a theoretical subsidence of three feet in depth and three feet in diameter immediately beneath the constructed cap section. Due to its better multi-axial elongation properties, LLDPE is typically able to withstand localized subsidence better than HDPE. However, since HDPE is more "rigid" than LLDPE and HDPE may be used for the geomembrane cap, the localized subsidence analysis was performed using HDPE to demonstrate adequacy of the product under the assumed condition. The calculated stress induced in the geomembrane was compared to an allowable stress, which was estimated by assuming approximately one-third of a typical 40-mil textured HDPE yield stress. The localized subsidence analysis concluded that the proposed geomembrane could safely withstand the induced tensile stresses resulting from the assumed deformation. Although HDPE geomembrane was evaluated in this analysis, LLDPE is the material of choice for this design due to its better multi-axial elongation properties.

Severe settlement has the potential to decrease or even reverse grades on the cap, and therefore, interfere with surface water drainage. As such, a conservative assessment was made of the maximum differential settlement that could occur. For this assessment, the following assumptions were made:

- The compaction efforts applied to the lifts of consolidated waste material will cause the majority of primary mechanical settlement to occur rapidly and that this initial settlement will be complete before cap construction is finished.
- The undisturbed waste material will not contribute significantly to future settlement.
- The long-term secondary settlement of the non-hazardous material relocated from the excavated areas is anticipated to occur following completion of the cap construction.

The condition most affected by settlement would be the location where the thickness of the relocated fill is the greatest. Based on the thickness of the relocated fill, the resulting post-construction settlement of the relocated fill material has been estimated to be approximately 0.04 feet over a span of 10 years. In addition, a differential settlement of 0.017 percent was observed between a location with the maximum relocated fill thickness and a location where the relocated fill thickness is zero or meets subgrade elevation. Based on these conservative settlement estimates, a positive surface water flow will still be maintained for the final cover because the cover slopes will be 3 percent or greater. Therefore, the settlement analyses indicates that settlement of 0.04 feet (0.6-inch) is not significant and that will not negatively impact the positive drainage of the final cap.

5.3.2.4 Bearing Capacity

The ultimate bearing capacity of the foundation soils was evaluated under both static and seismic conditions. Minimum required factors of safety for bearing capacity are 2.0 for static conditions and 1.5 seismic conditions. The ultimate bearing capacity of the underlying soils was calculated to be 123,443.3 pounds per square foot ($lb/ft^{2)}$ and the actual maximum loading (as-built condition) of the disposal area with the cap construction was calculated to be 1,247.5 lb/ft^2 under static conditions. These values yielded a factor of safety against bearing failure of 99, which exceeds the industry standard of 2. The ultimate bearing capacity of the as-built conditions under seismic condition was calculated to be 1309.8 lb/ft^2. This value against the ultimate bearing capacity of the foundation soils yield a factor of safety against bearing failure of 94 which exceeds the factor of safety of 1.5.

5.3.2.5 Frost Penetration

Geomembranes do not need to be placed below the frost zone according to published data on low temperature performance of geomembranes (Mills and Budiman, 1991; Peggs et al., 1991). Samples tested at low temperatures showed an increase in tensile strength and decrease in strain at failure compared to samples tested at ambient temperature. However, under low temperatures, failure strain was still in the order of several hundred percent, typical of a ductile material. Therefore, low temperature embrittlement of geomembranes (GMs) is not a design concern. This is consistent with USEPA guidance

(USEPA 1996) that indicates that the strength of GMs do not appear to be adversely affected by freeze-thaw cycles, at temperatures as low as -20ºC.

Although the geomembrane itself will not be affected by freezing, there is a potential for objects below the geomembrane to be uplifted by frost heave if the frost penetrates below the geomembrane. However, placement of the cap will reduce the availability of water. In addition, the potential for uplifted objects to damage the geomembrane will be minimized by proof-rolling of the ground surface and the preparation of a surface relatively free of rocks and stones below the geomembrane.

Based on the above discussion, a geomembrane underlain by a sub-base layer has been selected for utilization in the proposed cap section. In addition, the use of a soil grading fill relatively free of rocks and large particles (i.e., > $^{3}/_{8}$-inches) under the geosynthetics will minimize the potential for damage from uplifted, underlying materials.

To protect the toe of the cap from adverse impacts due to freezing of moisture within the drainage layer, a toe drain has been designed. This toe drain configuration replaces the cover soil and topsoil with riprap, providing a free-draining material to allow discharge of infiltration water collected by the drainage layer. The toe drain details are provided on Drawing 9.

5.3.2.6 Infiltration

One objective of capping the disposal area is to reduce surface water infiltration into the waste material. The infiltration reduction capability of the cap can be evaluated using the Hydrologic Evaluation of Landfill Performance (HELP) model (USEPA 1994). The HELP model, developed by the U.S. Army Corps of Engineers Waterways Experiment Station, is a quasi two-dimensional hydrological model of water movement across, into, through, and out of landfills. The model accounts for climatological, soil, and design data and utilizes a solution technique to conduct a water balance in terms of surface storage, runoff, infiltration, percolation, evapotranspiration, soil moisture storage, and lateral drainage. For this analysis, the HELP model was used to calculate the rate of infiltration into the waste under final closure conditions (e.g., after placement of the proposed cap and establishment of vegetation) for the maximum and minimum slope inclination.

The impermeability characteristics of a geomembrane are superior to a low permeability soil layer exhibiting a permeability of $1x10^{-7}$ cm/sec. For example, based on water vapor transmission tests performed by manufacturers and R. M. Koerner (Koerner 1998), the permeability of HDPE geomembranes range from $1x10^{-10}$ cm/sec to $1x10^{-14}$ cm/sec. Therefore, a permeability value of $1x10^{-13}$ cm/sec was assigned to the geomembrane for the HELP analyses.

Based on the results of the HELP model calculations, the cap system reduces the infiltration into the closed disposal area by 99 percent.

5.3.2.7 Drainage Layer

The purpose of a drainage layer is to convey water infiltrating the vegetative and cover soil layers to an outlet to minimize the time water is in contact with the geomembrane, and to reduce the hydraulic head over the geomembrane, thereby reducing the potential for sloughing and instability of the overlying soil layers.

Well-draining soils or synthetic materials are commonly used as drainage layers in landfill caps. For this design, two materials were evaluated using Site-specific conditions. These materials include an 18-inch thick layer of sandy cover soil and a geocomposite drainage layer consisting of an HDPE drainage net (i.e., geonet) with a nonwoven geotextile heat-bonded to one or both sides of the geonet.

For this evaluation, a water balance assessment was performed for the two drainage layer options over the minimum designed slope conditions (2 percent). The drainage layer under this scenario must readily convey infiltration to minimize head buildup within the overlying layers in order to maintain veneer stability of the cap system. The drainage layer evaluation for cover soil showed that an 18-inch thick drainage layer having a minimum hydraulic conductivity of 1.0×10^{-5} centimeters per second (cm/sec), or its equivalent, would be required. While this hydraulic conductivity could be achieved with a coarse sand or very clean medium sand, this value is near the upper bound of readily available materials. The drainage layer evaluation for the geocomposite drainage layer showed that the geonet would be required to have a minimum transmissivity of 5.0×10^{-4} meters squared per second (m^2/sec), which is well within the range of readily available geocomposite products.

For the drainage layer evaluation, the HELP model was also used to determine the maximum head buildup over the geomembrane, within the overlying soil layers. The HELP model calculations indicated that with a geocomposite, there is a maximum hydraulic head of 24 inches on the geomembrane from a peak daily storm event, where the critical flow path is expected to be 2 percent (a conservative, post-settlement value) for a maximum length of 280 feet. However, with such a shallow inclination, there is little risk of veneer slope failure due to this temporary saturated condition.

Based on the above analysis, a geocomposite has been selected for utilization in the cap over the entire disposal area.

5.4 Surface Water Management

A major design element for both the soil/historic fill excavation and on-Site containment activities is the management of surface water both during and after the completion of construction activities. The design of the proposed on-Site surface water management system is described below.

5.4.1 Overview

The South Plant is generally flat land that is bounded to the north by Pine Street and Waugh Avenue, to the east by the Old Erie Extension Canal, to the south by Mathay Run, and to the west by the Norfolk Southern railroad. The approximately 52 acre Site can be divided into two major areas, varying by topography:

- The Former Operating Areas containing former manufacturing buildings, railroad tracks, and flat, open land within the northern half of the Site. This area has very little variation in topography, with elevations generally between 938 and 939 feet above msl.
- The Formal Disposal Areas occupying the southern portion of the Site containing a soil mound with a low point at approximately elevation 934 feet above msl to a high point at approximately elevation 945 feet above msl.

In addition to these areas there are two existing drainage ditches, the Western Drainage ditch running along the western boundary of the Site and the Southern Drainage Ditch running along the southern boundary of the Site and transecting the Former Disposal Areas.

Under current conditions, surface water runoff from the eastern portion of the Former Operating Areas generally collects in storm drains that flow towards the east and then the south or flows overland towards the Southern Drainage Ditch. Surface water runoff in the western portion of the Former Operating Areas, including stormwater collected from the roofs of the manufacturing buildings, flows toward the Western Drainage Ditch. The Western Drainage Ditch merges with the Southern Drainage Ditch through a series of culverts near the southwest corner of the Site and the Southern Drainage Ditch discharges beyond the Site boundaries to Mathay Run. The land between the former manufacturing buildings and remaining foundations in the northern half of the Site is generally vegetated with a good stand of grass and, therefore, infiltration to the ground and evaporation is possible.

The remedy includes modifications to portions of the existing surface water management system, in the vicinity of the Former Disposal Areas. The layout for the proposed surface water management system is illustrated on Drawing 7. Existing surface water runoff flow patterns and stormwater management features are generally maintained. The Western Drainage Ditch is left unaltered and the disturbed portions of the Southern Drainage Ditch will be replaced, in-kind, or relocated, with flow diverted to a diversion channel providing equal capacity. A conveyance channel will be constructed within the proposed capped Former Disposal Areas to convey flow off the cap to the proposed stormwater

management basin, and will be built along the alignment of the existing Southern Drainage Ditch. In addition, a small amount of flow from the Former Disposal Areas cap will discharge directly into the new diversion channel.

The conveyance channel will collect runoff from the cap and discharge into the proposed stormwater management basin, which has been sized to accommodate the runoff from a 25-year, 24-hour storm event, giving consideration to the flow from a 100-year, 24-hour storm event. The diversion channel will route surface water from the Southern Drainage Ditch, around the Disposal Area, and back to the existing alignment of the Southern Drainage Ditch at a point just downgradient of the outlet of the basin, eventually discharging off-Site to Mathay Run. These channels have been sized to accommodate the runoff volume generated during the 25-year, 24-hour storm event, with a rainfall depth of 4.2 inches (PADEP 2000).

The detailed layout of the stormwater management basin and accompanying structures is provided in Drawing 7, with design details for the conveyance/diversion channels and stormwater basin shown in Drawings 10, 11, and 12.

5.4.2 Surface Water Modeling

For the surface water management design, a Site-wide surface water model was developed using HydroCAD software (version 8.5), developed by HydroCAD Software Solutions LLC (HydroCAD 2006), to calculate the expected stormwater flows and route those flows through on-Site surface water management systems. The following paragraphs describe the methods and input parameters used for the surface water model.

5.4.2.1 Selection of Analysis Method

Due to the relatively small size of the watershed, the United States Department of Agriculture (USDA) guidance document "Urban Hydrology for Small Watersheds-Technical Release 55 (TR-55 Manual) (USDA 1986) was used to select the method for determining runoff rates and volumes. HydroCAD was selected to model stormwater at the Site because it utilizes the same methods for developing surface water runoff rates and associated channel dimensions that are described in TR-55. After the runoff volumes (or hydrographs) were calculated, HydroCAD was used to route the flows through the detention structures using the Storage-Indication Method of hydrologic routing, where

Storage = Inflow - Outflow (for the given time interval)

5.4.2.2 Input Parameters

The input parameters for HydroCAD model included the following:

- Watershed delineation

- Watershed areas
- Curve numbers
- Time of concentration
- Storm type
- Design storm event
- Manning's roughness coefficient
- Channel slope
- Channel geometry
- Basin storage capacity
- Basin stage discharge relationship

These input parameters are described in the following paragraphs.

Drainage Area Delineation

Contributing drainage areas for each drainage feature were delineated using the Site topographic maps of existing conditions and proposed grading for the Former Disposal Areas cap, at a scale of 1:50 and a contour interval of 1 foot. In addition, Site photographs and first-hand accounts of existing conditions after storm events were used to accurately delineate drainage areas. The outlet points for each watershed were typically based on preferential flow patterns as determined by the topographic map of existing conditions and proposed grading of the disposal area.

It was conservatively assumed that all of the land within the cap limits of the Former Disposal Areas drains to the conveyance channel, eventually discharging into the stormwater basin. The drainage area contributing to the diversion channel was also conservatively delineated. It was also assumed that all runoff from roof tops and concrete foundations and slabs drain to the diversion channel. In addition, a majority of the remaining area of land in the northern half of the Site, mostly well vegetated surface, was assumed to drain to the diversion channel. Due to existing Site conditions, (i.e. flat topography and depressions, and prevalent ponding and pooling of water observed during Site visits after storm events), it was assumed that 60 percent of this area drains to the diversion channel.

Watershed Areas

After performing the watershed delineation, the area of each drainage area was determined by tracing the boundary of each area onto Site maps (Appendix D). These delineated drainage areas were transferred to digital maps and areas were calculated using computer assisted drawing (CAD) software.

Curve Numbers

The curve number (CN), which assists in the estimation of the runoff, was evaluated using the projected future land use (i.e., pavement, building, fields, capped Former Disposal Areas) in combination with the

land use, soil descriptions, and hydrologic classifications for the existing conditions. The CN values were obtained from the CN tables presented in TR-55 (USDA 1986). A CN of 79 was selected for the capped Former Disposal Area because they are intended to be maintained in an annually mowed meadow condition, with a fair stand of vegetation over silty soil. A CN of 98 was selected to model the runoff over proposed paved areas, as well runoff from existing manufacturing facility roofs and ruins of foundations and slabs.

Time of Concentration

The time of concentration for each drainage area was determined by evaluating the time that is required for water to travel from the hydrologically most distant point in the drainage area to the discharge point of the drainage area. After selecting this drainage pathway, the time of concentration was estimated by summing the travel times for sheet flow, shallow concentrated flow, channel flow, and pipe flow, where applicable, over this pathway. The calculations for these travel times were performed using methods outlined in the TR-55 (USDA 1986), as computed using HydroCAD. All of these computations involve the length, slope, and surface conditions (e.g., roughness) over the selected pathway and are presented in Appendix D.

Storm Type

The intensity and pattern of a storm varies depending upon the Site's location relative to geographic features (i.e., mountains, large water bodies, etc.) because these features affect the pattern of a storm. TR-55 (USDA 1986) defines four storm types (I, II, IIA, and III) and maps the geographic regions where each type occurs. For the Site surface water model, a Type II storm was chosen based on the region where the Site is located.

Design Storm Event

In accordance with the PADEP Solid Waste Management regulations, the surface water management system for a residual waste cap system must be designed to convey the runoff from a 25-year, 24-hour storm event. Therefore, the model was run to verify that proposed surface water management systems could convey the runoff from that regulated storm event. For design purposes, the model was also used to verify that the proposed systems could also accommodate a 100-year, 24-hour storm event. As outlined in the "Erosion and Sediment Pollution Control Program Manual" developed by PADEP (PADEP 2000), a 25-year, 24-hour storm event has a precipitation depth of 4.2 inches for Mercer County, Pennsylvania; while the 100-year, 24-hour storm event has a precipitation depth of 4.8 inches.

Manning's Roughness Coefficient

Manning's roughness coefficient is used in the design of conveyance and diversion channel. This coefficient is related to the resistance provided by the type and condition of the channel lining and inversely impacts the flow capacity of the channel. For example, a concrete-lined channel has a lower

roughness coefficient than a grass lined channel, but has higher flow capacity. The selected Manning's roughness coefficients are presented in Appendix D.

Channel Slope

The channel slope directly impacts the channel capacity and velocity. As a result, it is required input information for the model. The channel slope is determined by dividing the elevation difference by the channel length. A channel slope must be selected to ensure positive drainage and to assess the channel cross-section and channel velocity. To maintain existing flow patterns, channels were designed utilizing slopes similar to existing drainage ditches with inlet and outlet invert elevations chosen to maintain these slopes. Channel slopes of approximately 0.6 percent and 0.2 percent were used for the conveyance and diversion channels, respectively, in the calculations.

Channel Geometry

The channel geometry directly impacts the channel capacity. Therefore, the channel shape and dimensions are input. Several channel configurations were evaluated to select the most efficient channel geometry.

Basin Storage Capacity

Based on the proposed alignment of the conveyance channel, the discharge location downstream at the outlet of the channel, and land availability constraints, an initial location and footprint of the proposed stormwater management basin were determined. As the proposed basin is a truncated pyramid with a near square base, the surface area at each incremental elevation within the basin was calculated, assuming constructed side slopes of 3 feet horizontal to 1 foot vertical (3H:1V). These areas and stage elevations were then input into the HydroCAD model, as custom stage storage data, to be used during stormwater routing to determine the adequacy of the assumed basin configuration.

The proposed stormwater management basin will de dewatered primarily through the primary spillway - a 3-foot high, 18-inch diameter standpipe, serving as a primary spillway discharging into an approximately 100-foot long, 12-inch diameter culvert pipe serving as the primary outlet structure. In the event of a critical storm occurring before the basin can dewater completely from a previous storm, the basin has been designed with an emergency spillway, comprised of a 2-foot deep by 10-foot wide broad-crested overflow spillway. Modeling this configuration in the HydroCAD software allows for the routing of the storm event through the basin and dewatered by the structures, verifying the adequacy of the basin size and configuration.

A low-flow dewatering structure (e.g., a Faircloth skimmer) is being provided for the basin to promote dewatering below the crest of the primary spillway; however, the stormwater model assumed that this structure was non-functioning during a storm event in order to simulate critical conditions. With this

structure being considered clogged for this stormwater model, the starting water level in the basin at the beginning of the storm was set equal to the crest of the primary spillway.

Basin Stage Discharge Relationship

Using the HydroCAD model, the inflow hydrograph of the basin can be compared to the outflow hydrograph to ensure proper attenuation (that is, the reduction of the inflow to the basin). The size and configuration of this basin is then adjusted to determine the minimum basin size that provides adequate attenuation of the inflow to the basin. In addition, the peak elevation of stormwater within the basin is compared to the elevation of the crest of the emergency spillway to ensure it is not overtopped during the 100-yr storm event.

5.4.3 Stormwater Analyses Results

After developing all of the input parameters described above, the storm water analyses were performed. First, the watershed area, curve number, time of concentration, and storm type for proposed conditions were input to TR-55 for the 25-year, 24-hour storm event. The output from TR-55 is a runoff hydrograph for each drainage area that provides the peak stormwater runoff rates for each drainage area and corresponding drainage feature, as presented in Appendix D.

The peak runoff rate was used to design the channels and stormwater basin. The minimum channel depth required to convey the peak runoff rate was calculated using Manning's equation for open channel flow incorporating the channel slopes, the channel lining (i.e., Manning's roughness coefficient), and various geometric configurations. The channel depth was compared to the average depth during the storm event and appropriate freeboard was verified. This depth was then rounded to the nearest 0.50 feet. The designs of various channel configurations were compared to determine the optimal design. In addition, the erosive control of the selected channel lining material was assessed based on the anticipated maximum flow velocities and associated shear stresses. The channel configurations and depths for the final design are presented on Drawing 10. The following presents the selected surface water drainage system configurations that are designed to handle the peak runoff rates and associated flow velocities.

5.4.3.1 Conveyance Channel

The proposed conveyance channel will be a riprap lined trapezoidal channel on the capped Former Disposal Areas with side slopes of 3H:1V, a channel depth of 1.5 feet, a bottom width of 3 feet, and a constant longitudinal slope of 0.6 percent. The calculated peak discharge flow in the conveyance channel for a 25-year, 24-hour storm is 13.50 cubic feet per second (cfs) with an average depth of 0.82 feet and a maximum velocity of 281 feet per second (fps).

The results of the HydroCAD analysis show that a 1.5-foot deep channel will convey the flow, while maintaining at least 0.5 feet of freeboard. In addition, the selected riprap size (R-2) will provide the appropriate level of erosion resistance based on the flow velocities and associates shear stresses within the channel.

5.4.3.2 Diversion Channel

The proposed diversion channel along the western toe of the capped Disposal Area will be a riprap lined trapezoidal channel with side slopes of 3H:1V and 2H:1V, a channel depth of 2.5 feet, a bottom width of 4 feet, and a constant longitudinal slope of 0.2 percent. This shallow slope and channel configuration mimics the existing conditions of the Southern Drainage Ditch that this channel will replace. The calculated peak discharge flow for a 25-year, 24-hour storm is 50.53 cfs with an average depth of 1.98 feet and a maximum velocity of 2.86 fps.

The results of the HydroCAD analysis show that a 2.5-foot deep channel will convey the flow, while maintaining at least 0.5 feet of freeboard. In addition, the selected riprap size (R-2) will provide the appropriate level of erosion control based on the flow velocities and associates shear stresses within the channel.

5.4.3.3 Stormwater Management Basin

A stormwater management basin is proposed for the Site in order to attenuate the increase in peak runoff due to the construction of a low permeability cap over the Former Disposal Areas. As previously discussed, the basin will also be equipped with an emergency spillway for use during storm events that is designed to convey the runoff from the 25 year and 100-year, 24-hour storm events. The emergency spillway will be riprap-lined, with a trapezoidal cross section having side slopes of 5H:1V, a channel depth of 2 feet and a base width of 10 feet. Calculations included in Appendix D show the routing of the inflow hydrographs from the contributing conveyance channel and related drainage area. The hydrograph for the 100-year, 24-hour storm event was routed through the basin under a conservative scenario in which the starting water level was at the crest of the primary spillway. The maximum water level attained under this scenario is Elevation 939.56, only 0.56 feet above the crest of the primary spillway and nearly half a foot below the crest of the emergency spillway. This water level would result in no discharge through the emergency spillway. It was conservatively assumed that no infiltration through the basin would occur during the course of the storm. An additional dewatering device, a skimmer attached to the primary spillway structure, is included in the design. However, to provide conservative analysis of the basin, the dewatering effects were not included in the HydroCAD model under the assumption that the skimmer may become clogged and ineffective.

A grading plan for the stormwater basin is shown on Drawing 7 and details for the basin can be found on Drawings 11 and 12.

5.4.3.4 Culverts

There is one location where an existing gravel access road will traverse the redirected flow from the southern drainage ditch to the diversion channel. Flow within this area is currently conveyed under the roadway via an 18-inch diameter corrugated metal pipe (CMP) culvert. This culvert will be plugged and replaced by another 18-inch diameter reinforced concrete pipe (RCP) adjacent to it. This new culvert will convey the re-routed flow from the Southern Drainage Ditch under the road and to the diversion channel. As an in-kind replacement will be made, the new culvert is assumed to be an adequately sized replacement to convey the stormwater runoff.

In addition, further downstream of the diversion channel, a ditch discharges into a 30-inch diameter CMP culvert that conveys water into the existing Southern Drainage Ditch. This culvert will be shortened to discharge directly into the proposed diversion channel, where this flow will eventually discharge back into the Southern Drainage Ditch. Locations of these culvert crossings are shown on Drawing 7.

5.5 Groundwater Response Actions

Further response actions were identified for groundwater to demonstrate that on-Site concentrations of arsenic and manganese in groundwater exceeding the Residential Used Aquifer MSCs will not impact downstream receptors and that the proposed cleanup standards are protective of human health and the environment. These response actions include performing eight quarters of additional groundwater and surface water monitoring along with semi-annual stormwater monitoring to do the following:

- Continue to demonstrate the presence of an effective hydraulic barrier at Mathay Run that intercepts impacted groundwater before it moves off-Site
- Demonstrate compliance with selected groundwater cleanup standards
- Continue to demonstrate that there are no impacts to surface water from groundwater discharges to Mathay Run

Groundwater and surface water monitoring activities are detailed in the Groundwater, Surface Water, And Storm Water Monitoring Plan, which is included as Appendix E.

5.6 General Construction Activities

General construction activities including construction of stormwater basins/channels and replacement of subsurface utilities that require excavation of on-Site soil/historic fill will follow the waste management and backfilling practices defined in Sections 5.2.2 and 5.2.3.

5.7 Technical Specifications

For the selected response actions, the following technical specifications have been developed, following the Construction Specification Institute (CSI) format, for the Revised Cleanup Plan and are included as Appendix C.

SECTION	DESCRIPTION
01010	Summary Of Work
01015	Definitions
01041	Project Coordination
01050	Field Engineering/Surveying
01200	Project Meetings
01300	Submittals
01400	Quality Control
01540	Job Site Security
01550	Site Access And Traffic Control
01562	Dust Control
01564	Health And Safety Specifications for Construction
01590	Temporary Facilities
01700	Project Closeout
01720	Project Record Documents
01740	Warranties
02100	Site Preparation
02110	Site Clearing and Grubbing
02125	Temporary and Permanent Erosion and Sedimentation Control
02130	Monitoring Well Abandonment
02140	Construction Dewatering
02150	Shoring And Bracing
02220	Excavation
02221	Impacted Soil Excavation & Management
02223	Backfill And Fill
02233	Coarse Aggregate
02235	Vegetative Support Layer
02271	Stone Riprap
02340	In-Situ Soil/Fill Pre-Conditioning
02402	Liquids Handling And Disposal
02418	Geocomposite Drainage Layer
02431	Equipment Decontamination
02595	Geotextile
02597	LLDPE Geomembrane
02598	HDPE Geomembrane
02610	Polyvinyl Chloride (PVC) Pipe, Plastic Valves, and Fittings
02831	Chain Link Fence
02936	Seeding
03300	Cast-In-Place Concrete

It should be noted that Section 01564 of the Technical Specifications provides Health and Safety Plan (HSP) Specifications. This section includes specifications for the minimum requirements of an activity specific HSP as part of the design. The selected contractor will be responsible for developing and implementing a Health and Safety Plan that will be consistent with the contractor's specific means and

methods for conducting the work. As well as satisfying the minimum requirements of OSHA 1910 and 1920, key elements of the HSP will include dust and emission controls, and associated air monitoring.

5.8 Construction Sequencing

The proposed sequence for construction activities is shown on Drawing 14 and listed below:

1. Notify local and state regulators of pre-construction meeting 1 week before meeting.
2. Hold pre-construction meeting.
3. Install temporary erosion control measures, including but not limited to stabilized construction entrance and silt fence.
4. Install temporary access roads.
5. Conduct clearing operations within 6-inches of the existing grade in the excavation areas and the disposal area, mulching yard waste in the laydown area designated for such. Yard waste may be used for temporary erosion control and stabilization during construction.
6. Construct the sediment basin adjacent to the Disposal Area.
7. Construction the Diversion Channel, around the Disposal Area. A pump bypass system may be required for the construction of this diversion and again during the construction of the engineered cap on the Disposal area.
8. For the excavation areas:
   A. The impacted soil/historic fill with total lead concentrations greater than 1,000 mg/kg will be pre-condition in-situ, tested for conformance with off-Site disposal criteria, excavated to the initial depths shown in the Cleanup Plan, and staged on-Site pending off-Site disposal. Upon receipt of favorable testing results, the soils will be disposed off-Site in a permitted disposal facility.
   B. The impacted soil/historic fill with VOC impacts greater than Soil to Groundwater MSCs will be excavated to the initial depths shown in the Cleanup Plan, and staged on-Site pending off-Site disposal. Upon receipt of favorable testing results, the soils will be disposed off-Site in a permitted disposal facility.
   C. The remaining impacted soil/historic fill with total lead exceeding 450 mg/kg will be excavated to the initial depths shown in the Revised Cleanup Plan, staged, and tested for disposal. Upon receipt of the testing results, the soil/historic fill will be disposed off-Site (if failing the TCLP test) or disposed in the disposal area (if passing the TCLP test).
   D. The soil/historic fill in the side-walls and bottom of the excavation shall be sampled and tested in accordance with the post-excavation sampling protocol in Specification 02221. If the soil/historic fill is shown to have constituents of concern (COCs) at concentrations above action level, an additional two feet of material will be excavated, in accordance with 6 b above.
   E. When the analytical testing of the soil/historic fill remaining in the excavation indicate that COCs are below action levels, a marker geotextile shall be placed in the excavation and the area restored in accordance with the Revised Cleanup Plan, by backfilling and seeding, or backfilling and paving.
   F. The excavation areas shall be excavated and restored in the following order: Downgradient SW1, Downgradient SW2, Western Drainage Ditch, Southern

Drainage Ditch, select locations in the Former Disposal Areas, and Former Operations Areas.

G. The temporary access roads will be removed as areas are excavated and restored. If there is spillage from the haul truck tires on the access roads, the material removed from these access roads will be disposed in the Former Disposal Areas.

9. For the Former Disposal Areas:
   A. The stumps shall be removed to two-feet below the finished subgrade of the engineered cap to be placed atop the area.
   B. Railroad ties and concrete rubble/riprap stockpiled in the Former Disposal Areas shall be buried in the Former Disposal Areas such that they are two-feet below the finished subgrade of the engineered cap or possibly hauled away as site clearing debris
   C. Material removed from the excavation areas which pass the TCLP test may be disposed in the Former Disposal Areas. This material shall be placed in 12-inch thick compacted, horizontal lifts and shall be compacted to 95 percent of the maximum dry density as determined by the Standard Proctor Test (ASTM D698).
   D. Upon placement of the final excavated impacted soil/historic fill from the Excavation Areas on-Site, the Disposal Area shall be graded such that no area has a slope steeper than 3H:1V and less than 2 percent.
   E. The engineered cap may be constructed.
10. Areas disturbed during construction shall be stabilized within 14 days of achieving final grade.
11. This sequence may be adjusted in the field by the Contractor based upon actual conditions encountered, with the approval of the Trinity and/or its designated representative.

5.9 Construction Quality Assurance

The Construction Quality Assurance (CQA) Plan is presented in Appendix F. The CQA Plan describes the procedures to be followed during CQA monitoring of activities associated with the construction of soil and geosynthetic components of the cap system for the Former Disposal Areas. The CQA Plan is intended as an implementation document for CQA monitoring personnel.

6.0 POST-REMEDIATION CARE PLAN

6.1 Institutional and Engineering Controls

At the completion of remedial construction activities, Site deed restrictions and access controls will be put in place to limit exposure to COCs remaining on-Site.

6.1.1 Deed Restrictions

The selected response actions will require deed restrictions on the property to prohibit excavation in the Former Disposal Areas and prohibit use of the overburden groundwater. In accordance with Act 2 and the Universal Environmental Covenants Act (UECA), the deed restrictions will be made in the form of a Declaration of Environmental Covenants that will be executed and recorded with the Mercer County Recorder of Deeds. A copy of the recorded Declaration of Environmental Covenants will be provided to PADEP with the Final Report for the Site.

6.1.2 Site Access Controls

For the majority of the Site, access is currently restricted by a security fence, warning signs, a day-time security guard, and full-time security cameras. However, portions of the Former Disposal Areas, specifically AOC-1 and AOC-11 are outside of the fence. Therefore, this Revised Cleanup Plan provides for the installation of new security fencing and new access road, independent of the manufacturing portion of the Site, to limit future access to the closed Former Disposal Areas.

6.1.2.1 Fencing and Signage

After completion of remedial activities permanent chain link fence will be constructed around the perimeter of the disposal area. Unauthorized access to the Site will be controlled by the chain link fence and a gate (See Figure 2). One sign will be posted at the Site entrance to the disposal area notifying all persons of the final capped area, and prohibition against further receipt of material. A locked gate at the disposal area entrance will prohibit entry to the Site after closure. Warning signs that indicate that the Site is a closed area and prohibit trespassing signs will be installed around the perimeter of the disposal area at 200 foot intervals. The signs shall also provide the telephone number of Borough of Greenville and Hempfield Township for further information.

6.1.2.2 Access Roads

Access roads will be constructed along the perimeter of the disposal area in order to provide access to disposal area cap, storm water management and erosion protection inspections.

6.2 Operations and Maintenance

For the selected response actions, an Operations and Maintenance (O&M) Plan has been developed for of the systems installed pursuant to the Revised Cleanup Plan to ensure the integrity of the response actions. The O&M Plan includes inspection, maintenance, and repair activities for the following items and is included as Appendix G:

- Cap System
- Stormwater Management System
- Perimeter Fence
- Access Roads

6.3 Long-term Monitoring

At the conclusion of the groundwater response actions, Trinity will perform additional groundwater, surface water, and storm water monitoring at the Site to demonstrate that there are no releases from the closed Former Disposal Areas. This long-term monitoring will include semi-annual sampling for the first 3 years and annual monitoring for the next 5 years. The long-term monitoring requirements are detailed in the Groundwater, Surface Water, And Storm Water Monitoring Plan, which is included as Appendix F.

7.0 PERMITTING

After PADEP approval of the Revised Cleanup Plan, Golder will submit permit application packages, on behalf of Trinity, in support of the Site cleanup/construction activities for approval by State and local authorities. The permits are necessary for construction to advance. At this time, Golder anticipates preparing permit application packages for the following permits:

- Soil Erosion and Sediment Control Permit, which is required for disturbances of more than 5,000 square feet;
- National Pollution Discharge Elimination System (NPDES) for construction activities, which is required for disturbances of more than 1 acre; and,
- Local zoning and Site development permitting from Hempfield Township and the Borough of Greenville.

The permit requirements are described in more detail below:

7.1.1 Soil Erosion and Sediment Control Permit

In accordance with PA 25 Chapter 102 - Erosion and Sediment Control, an erosion and sediment control permit requires the submission of the following information:

- Narrative explaining the Site history, the proposed Act 2 cleanup efforts, and the project remedial construction activity components
- Extent of temporary disturbance
- Layout and details of the temporary erosion controls to be used during construction
- Layout and details of the long-term permanent stabilization controls
- Construction schedule and sequencing
- PADEP-approved worksheets showing the design of temporary controls complies with minimum requirements of the *Pennsylvania Soil Erosion and Sediment Control Program Manual* (Manual) (April 2000)

This permit will be issued by the Mercer County Conservation District. The permitting process typically takes approximately 3-5 months from submission of the initial documents to receipt the permit.

7.1.2 Construction Activity Associated with an Industrial Activity - NPDES permit

Under the Clean Water Act and the Pennsylvania Clean Streams Act, a National Pollution Discharge Elimination System (NPDES) permit is required for stormwater discharges associated with an industrial activity, including construction, if more than one acre of earth disturbance occurs during a construction project. For this Site, a General Permit will be obtained since the Site does not lie within the drainage area of a water body that is classified as exceptional value (EV) or high quality (HQ). In Pennsylvania, this General Permit is administered by the County Soil Conservation District, and is reviewed in

conjunction with the document submitted to obtain the Soil Erosion and Sediment Control Permit. The NPDES Application package will have the following components:

- Application Form
- Pennsylvania Natural Diversity Inventory (PNDI) Search (output from online environmental review)
- Post-Construction Stormwater Management Plan
- PADEP Form B
- PADEP Form B-1, containing certification from a Pennsylvania licensed professional engineer
- Application fee

For the Revised Cleanup Plan, Golder has assumed that the PNDI search will not identify any possible environmental issues that will require follow-up or further field investigations by PADEP or other State or Federal Agencies. The NPDES permit process is estimated to take at least 3 months, after submission of the permit application package.

7.1.3 Local Permits

Hempfield Township and Greenville Borough have adopted a Stormwater Management Ordinance pursuant to Act 167. Due to Pennsylvania's efforts to improve water quality in streams and rivers under Act 167, PADEP has instituted requirements for stormwater management controls on new construction efforts, involving water quality requirements, limitations of runoff rate, and runoff volume controls. For runoff rates and volume controls, post-construction runoff rates must be less than pre-construction runoff rates for the 2-year, 10-year, 25-year, and 100-year, 24-hour storm events. PADEP strongly encourages infiltration of stormwater, through the use of Best Management Practices (BMPs) as defined in the Pennsylvania Stormwater Best Management Practices Manual (PADEP, May 2008). Construction of impermeable caps over the disposal areas, and possibly in the former operations areas, will require the construction of a robust stormwater management control system servicing these areas. This design may include the following components:

- A good stand of vegetative cover (i.e. greater than 75% coverage) over the impermeable cap on the former disposal areas
- Stormwater conveyance channels
- Stormwater conveyance culverts
- Stormwater detention basin
- Basin low-flow, low-turbidity dewatering structures
- Energy dissipaters at culvert outlets
- Level spreaders which promote infiltration

This system will be accounted for during the detailed engineering design effort, but the supporting calculations outlined above will only be submitted to the municipalities to demonstrate compliance with the Act 167 requirements.

At this time, Golder has assumed that Site development permits will be required from Hempfield Township. Consequently, the permitting activities are anticipated to include the following:

- Attendance at a Planning Board meeting for each municipality, showing a graphic describing the project in order to get concurrence from the Planning Boards that the project complies with the municipal zoning regulations, so that the project may then proceed to the next permitting step
- Submission of detailed Site Plans (i.e. Detailed Design Drawings with municipal specific required-information added) and supporting stormwater design calculations (described above)
- Application forms and fees

8.0 AGREEMENTS WITH THIRD PARTIES

Portions of the Western Drainage Ditch are within the Norfolk Southern right-of-way. Therefore prior to construction, Trinity will have to negotiate an access agreement with Norfolk Southern that will allow Trinity's remedial contractor to operate within 25 feet of the centerline of the track, clear the area of vegetation, remove and/or protect out-of-service electric poles, remove impacted soil/historic fill, and restore the drainage ditch. This agreement will likely require that any contractors working in this area will have to comply with Norfolk Southern specific health & safety (H&S) requirements. These may include railroad specific safety training and the use of Norfolk Southern flagmen. These requirements are identified in the document "Norfolk Southern Operating Guidelines for Contractors", effective April 19, 2010.

At this time, no other third party agreements are anticipated.

9.0 PUBLIC PARTICIPATION

In accordance with Act 2 requirements (25 Pa. Code Section 250.5(b)) and PADEP guidance, Trinity developed a public involvement program to do the following:

- Provide local community members and interested parties in the vicinity of surrounding the South Plant property timely and accurate information about the Site and upcoming cleanup activities.
- Promote public involvement in ongoing Site activities and provide opportunities for all interested parties to provide input to the various phases of the cleanup process

As part of this process, Trinity developed the Public Involvement Plan (PIP) and solicited input and received approval for the document from representatives of Hempfield Township and the Borough of Greenville. The approved PIP defines a schedule for public notices, comment periods, and public meetings that coincide with the development and submittal of Site related documents. For both the RI Report and the CWP phases of the project, Trinity placed the documents in local repositories for public review, published notices of their availability for public comment, and held public meetings. For the RI Report, Trinity also prepared a Responsiveness Summary and submitted it to PADEP.

For the Cleanup Plan phase of the public involvement program, Trinity placed the draft Cleanup Plan in local repositories for public review on November 2, 2011 and published notices of its availability for 30-day public comment in the Greenville Record Argus on November 4, 2011 and the Sharon Herald on November 6, 2012. The proofs of publication for these public notices are included as Appendix H.

The 30-day public comment period for the draft Cleanup Plan ended on December 5, 2011. During this period, there were no written questions submitted to Trinity and there were no calls to the toll free hotline regarding the draft document.

For the Revised Cleanup Plan phase of the public involvement program, Trinity placed the draft Revised Cleanup Plan in local repositories for public review on January 21, 2013 and published notices of its availability for 30-day public comment in the Sharon Herald on January 22, 2013. The proofs of publication for these public notices are included as Appendix H.

The 30-day public comment period for the draft Revised Cleanup Plan ended on February 22, 2013. During this period, there were no questions submitted to Trinity and there were no calls to the toll free hotline regarding the draft document.

For this document, Trinity has prepared a Responsiveness Summary that addresses public comments made during both the CWP phase, the Cleanup Plan phase, and the Revised Cleanup Plan phase of the project as Appendix I.

10.0 SCHEDULE

In accordance with the PIP and the approved project schedule, Trinity will submit the Revised Cleanup Plan to PADEP for review and approval after the conclusion of the public comment period. Upon submission of the Revised Cleanup Plan to PADEP, Trinity will continue to prepare permit application packages. Trinity plans to submit these documents to the appropriate agencies within two weeks of receipt of PADEP comments on the Revised Cleanup Plan, provided PADEP comments are minor and will not require significant changes to the remedial design. Trinity will also arrange pre-application meetings with these agencies to review the project with them prior to submission of the permit application packages. The purpose of the pre-application meetings is to verify the required contents of the package, and to obtain technically-appropriate special requests that the permit reviewers may require.

11.0 SIGNATURES

The following representative of Trinity Industries, Inc. requests approval of this Revised Cleanup Plan by the Pennsylvania Department of Environmental Protection:

Mr. Richard T. Barrett
Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

12.0 REFERENCES

Golder 2007. Final Revised Remedial Investigation Work Plan (RI Work Plan), Golder Associates Inc. October 31, 2007.

Golder 2008a. Interim Results South Plant Remedial Investigation, Golder Associates Inc., June 11, 2008.

Golder 2008b. Revised Supplemental Investigation Work Plan (SI Work Plan), Golder Associates Inc., October 30, 2008.

Golder 2010a. Revised Remedial Investigation Report – South Plant, Golder Associates Inc., March 1, 2010.

Golder 2010b. Public Involvement Plan – Trinity South Plant Site, Golder Associates Inc., September 2010.

Golder 2011. Cleanup Work Plan – South Plan Site, Golder Associates Inc., March 25, 2011.

Golder 2012. Cleanup Plan – South Plant Site, Golder Associates Inc., January 12, 2012.

HydroCAD Computer Solution LLC., HydroCAD 8.5 Computer software.

Koerner 1998. Designing with Geosynthetics, Fourth Edition, Prentice-Hall, Inc., Koerner, R.M., 1998.

PADEP 2000. Erosion and Sediment Pollution Control Program Manual, Pennsylvania Department of Environmental Protection, Office of Water Management, April 2000.

PADEP 2007. Letter Approving the Final Revised RIWP, Pennsylvania Department of Environmental Protection, November 14, 2007.

PADEP 2009. Letter Approving the Revised SIWP with Modifications, Pennsylvania Department of Environmental Protection, January 21, 2009.

PADEP 2010. Letter Approving the Revised RI Report with Modifications, Pennsylvania Department of Environmental Protection, March 31, 2010.

PADEP 2011a. Letter acknowledging receipt of the Public Involvement Plan and no public comments that would significantly change the content of the RI Report, Pennsylvania Department of Environmental Protection, January 13, 2011.

PADEP 2011b. Letter Approving the Cleanup Work Plan with Modifications, Pennsylvania Department of Environmental Protection, June 7, 2011.

Pennsylvania 1995. Pa Code (Chapter 250) § 250 Land Recycling and Environmental Remediation Standards Act (Act 2 of 1995), Commonwealth of Pennsylvania.

Pennsylvania 2002. Land Recycling Program Technical Guidance Manual, Commonwealth of Pennsylvania, June 8, 2002.

Pennsylvania 2006. Consent Order and Agreement (COA), Commonwealth of Pennsylvania December 21, 2006.

USEPA 1994. The Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering Documentation for Version 3, EPA/600/R-94/168b, U.S. Environmental Protection Agency, Risk Reduction Engineering Laboratory, Cincinnati, OH. Schroeder, P.R., Dozier, T.S., Zappi, P.A., McEnroe, B.M., Sjostrom, J.W. and Peyton, R.L., September 1994.

USEPA 1996. Effects of Freeze-Thaw Cycling on Geomembrane Sheets and Their Seams, Proc. Geosynthetics '95, IFAI, St. Paul, MN, pp. 853-866, Comer, A. I., Sculli, M. L. and Hsuan, Y., EPA/600/S-96/004, USEPA National Risk Management Research Laboratory, August 1996.

USEPA 2002. RCRA Waste Sampling Draft Technical Guidance- Planning, Implementation, and Assessment, USEPA Office of Solid Waste and Emergency Response, EPA530-D-02-002, August 2002.

USDA 1986. TR-55: Urban Hydrology for Small Watersheds (TR-55), USDA Soil Conservation Service, June, 1986.

TABLES

TABLE 2-1
SUMMARY OF COC EXCEEDANCES BY AOC
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

AOC	Description	COC Exceedances		Former Operations in the Vicinity of the AOC	Probable Source(s) of COCs
AOC-S1	"Old Ballfield"	Surface Soil	Hexavalent Chromium, Lead, Manganese	Disposal area.	Historic records indicate this area may have been used to deposit excavated soil from another facility that Trinity operated in Greenville, Pennsylvania.
		Subsurface Soil	Gamma-BHC, Aldrin, Dieldrin, Arsenic, Lead, Manganese		
AOC-S2	Former Paint Shop	Surface Soil	Manganese	Abrasive blasting / railcar painting and drying / new paint storage / used paint and solvent storage. Painting in closed engineered booths with concrete floors and air filtration system	Painting activities are the probable source of the low VOC exceedances.
		Subsurface Soil	2,4-Dinitrotoluene, 2,6-Dinitrotoluene, Arsenic, Manganese		
AOC-S3	Former Pickling Area	Surface Soil	1,3,5-Trimethylbenzene, Napthalene, Antimony, Hexavalent Chromium, Lead, Manganese, Zinc	Building 24A - Pickler Cover. Surface preparation and painting including sandblasting, pickling (sulfuric & phosphoric acid baths), painting, & drying areas. Storage of prefabricated steel and railcar parts Partially roofed areas. Partially paved floors with storm drains.	Painting and picking (acid bath) activities in this partially paved area for numerous years are the probable source of VOC, SVOC, and metals exceedances at the surface and at depth. Records show historic use of lead-based paint, solvents, sulfuric acid, and phosphoric acid in these areas. Metal impacts at depth are consistent with the increasing solubility/mobility of these metals in lower pH (acidic) conditions.
		Subsurface Soil	Ethylbenzene, Toluene, Xylenes, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Benzo[a]pyrene, Naphthalene, Arsenic, Lead, Manganese, Zinc		
AOC-S4	Old Erie Extension Canal	Surface Water	No Exceedances	Office and employee parking lot	No direct discharge from Site. Upstream sediment samples have similar concentrations. Therefore, stormwater discharges from multiple off-Site sources (urban run-off) likely lead to the SVOC, pesticide, PCB, and metals impacts in sediment.
		Sediment	Acenaphthene, Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Bis(2-ethylhexyl) Phthalate, Chrysene, Dibenzo[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, 2-Methylnaphthalene, Naphthalene, Phenanthrene, Pyrene, Dieldrin, Aroclor 1254, Aroclor 1260, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Nickel, Zinc, Cyanide		
AOC-S5	Transformer Areas	Surface Soil	No Exceedances	Main Electric Substation	NA
		Subsurface Soil	No Exceedances		
AOC-S6A	Boiler/Power House, Coal Pile, and Transformers	Surface Soil	Lead	Power House. Powered by coal from 1911 to about 1944. Converted to oil.	Lead exceedances in surface soil on east side of Power House are likely the result of cross-contamination from painting/pickling area. Low lead, and nickel exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Lead, Nickel		

TABLE 2-1
SUMMARY OF COC EXCEEDANCES BY AOC
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

AOC	Description	COC Exceedances		Former Operations in the Vicinity of the AOC	Probable Source(s) of COCs
AOC-S6B	Former 15,000 gallon Fuel Oil AST (partially buried)	Surface Soil	Lead, Manganese	Power House. Former fuel oil tanks on north side.	The single lead exceedance in surface soil may be related to paint from the exterior of the former tank or it may simply be an analytical/sampling outlier.
		Subsurface Soil	Arsenic, Lead, Manganese		Low arsenic, lead, and manganese exceedances in subsurface soil are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
AOC-S7	Mathay Run	Surface Water	No Exceedances	Former disposal areas.	No related exceedances in surface water or groundwater. Upstream sediment samples have highest concentrations. Therefore, stormwater discharges from multiple off-Site sources (urban run-off) likely the cause of SVOC, pesticide, PCB, and metals impacts in sediment.
		Sediment	Acenaphthene, Acenaphthylene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Bis(2-ethylhexyl) Phthalate, Chrysene, Dibenzo[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, 2-Methylnaphthalene, Phenanthrene, Pyrene, Dieldrin, Aroclor 1254, Arsenic, Cadmium, Copper, Iron, Lead, Nickel, Zinc, Cyanide		
AOC-S8	Former Paint Shop (also former RCRA tank storage area)	Surface Soil	No Exceedances	Paint Storage & Former Acid Filter/Neutralizing Tanks. Used acid treatment/storage. Short-term paint waste storage before off-site disposal	Low arsenic and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Manganese		
AOC-S9	Former Forge Shop and Waste Paint Storage Room (northwest corner of Forge Shop)	Surface Soil	No Exceedances	Structural Shop	Low benzo[a]pyrene exceedances are likely the result of previous operations.
		Subsurface Soil	Benzo[a]pyrene, Arsenic, Lead, Manganese		Low arsenic, lead, and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
AOC-S10	Former Paint Shop	Surface Soil	No Exceedances	Weld Wire Room	NA
		Subsurface Soil	No Exceedances		
AOC-S11	Miscellaneous Debris/Fill Area Adjacent to AOC-S1	Surface Soil	Iron, Lead, Manganese, Mercury, Nickel	Flood control dike/fill area. Dump Area	Historical records indicate AOC-S11 was as a "Dump Area."
		Subsurface Soil	Gamma-BHC, Aldrin, Dieldrin, Antimony, Arsenic, Barium, Cadmium, Hexavalent Chromium, Cobalt, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Zinc		

TABLE 2-1
SUMMARY OF COC EXCEEDANCES BY AOC
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

AOC	Description	COC Exceedances		Former Operations in the Vicinity of the AOC	Probable Source(s) of COCs
AOC-S12	Western Drainage Ditch	Surface Soil	Lead	Drainage of western areas of the property. May be connected hydraulically to stormwater drains in South Yard	Lead exceedances in shallow soil in this area are likely the result of lead impacted soils being transported by stormwater drains in the South Yard (former CB&I painting/drying area).
		Subsurface Soil	No Exceedances		
AOC-S13	Maintenance Building (former Machine Shop) Chemical/Waste Storage Area and Former 1,000 gallon gasoline storage tank located on north side of building	Surface Soil	Manganese	Machine Shop Maintenance building (related to property upkeep)	Manganese exceedance is likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	No Exceedances		
AOC-S14	Production Building North Chemical/Waste Storage Area	Surface Soil	No Exceedances	Plate Shop Railcar manufacture	Low arsenic exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic		
AOC-S15	Production Building South Chemical/Waste Storage Area	Surface Soil	No Exceedances	Building 2A/2B - Weld Area "C" Railcar manufacture	Low arsenic exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic		
AOC-S16	Transformer Area West Side of Production Building	Surface Soil	No Exceedances	Electric Transformers	NA
		Subsurface Soil	No Exceedances		
AOC-S17	Sandblast Sand Fill Area and General Fill Area (former permitted solid waste disposal area)	Surface Soil	Lead, Nickel	Sand Disposal Area. Disposal of spent blast grit and dust. No documentation of closure.	Lead, mercury and nickel exceedances are likely the result of the disposal of waste dust, grit, and sand from the sand blasting process near the painting/pickling area. Low arsenic and selenium exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Lead, Manganese, Mercury, Nickel, Selenium		
AOC-S18	Drainage Ditch South Fence Line receives discharge from three site outfalls	Surface Soil	Lead, Manganese	Drainage for eastern operations areas of the property.	Lead exceedances in shallow soil in this area are likely the result of lead impacted soils being transported by stormwater from the former painting/picking area. Low arsenic and manganese exceedances are likely due to natural/background conditionsin soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Manganese		
AOC-S19	Former Acid Filter Drainage Pond (subject of RCRA Preliminary Assessment)	Surface Soil	Lead	Acid Filter Drainage Pond. Spent pickling acid disposal from 1937 to 1970. No documentation of closure.	Lead exceedances in this area are likely the result of disposal of waste pickling acids for approximately 30 years. The majority of the operating history of this area occurred prior to current environmental laws and best management practices for chemicals and wastes. There is no record of closure of this disposal pond. Low arsenic and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Lead, Manganese		
AOC-S20	Former Incinerator (also former RCRA 55 gallon drum storage area)	Surface Soil	No Exceedances	Incinerator	Low arsenic exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic		

TABLE 2-1
SUMMARY OF COC EXCEEDANCES BY AOC
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

AOC	Description	COC Exceedances		Former Operations in the Vicinity of the AOC	Probable Source(s) of COCs
AOC-S21	Former Plate Painting Yard (current South Yard)	Surface Soil	Lead, Manganese	Current South Yard - Stage & Painting of Steel	Historic painting/drying activities in this open partially paved area are likely the source of lead exceedances. Historic records show the use of lead-based paint.
		Subsurface Soil	Arsenic, Lead, Manganese	Open area with partially paved floors and storm drains.	
AOC-S22	Former 15,000 Gallon Fuel Oil Above Ground Storage Tank	Surface Soil	No Exceedances	15,000 Gallon Fuel Oil Above Ground Storage Tank	NA
		Subsurface Soil	No Exceedances		
AOC-S23	Railroad Switches (SB-26 & SB-27)	Surface Soil	No Exceedances	Railroad switches	NA
		Subsurface Soil	No Exceedances		
AOC-S24	Former Above Ground Storage Tanks (Two 23,000 Gallon Fuel Oil Tanks)	Surface Soil	No Exceedances	Above Ground Storage Tanks (Two 23,000 Gallon Fuel Oil Tanks) Between Building 4 and Building 2A	Low antimony, arsenic, lead, and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Antimony, Arsenic, Lead, Manganese		
AOC-S25	Former Underground Storage Tanks (10,000 Gallon Fuel Oil Tank, 5,000 Gasoline Tank)	Surface Soil	No Exceedances	Former Underground Storage Tanks (10,000 Gallon Fuel Oil Tank, 5,000 Gasoline Tank)	Low cobalt exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic		
General Upgradient Conditions	Up-gradient/Non-operational Area/Potential Impacts from Off-site (Northwest area near MW-S3)	Surface Soil	No Exceedances	Drainage from Offsite Areas	Low arsenic, lead, and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Lead, Manganese		
General Upgradient Conditions	Up-gradient/Non-operational Area/Potential Impacts from Off-site (Northeast area near MW-S4)	Surface Soil	No Exceedances	Drainage from Offsite Areas	Low arsenic and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Manganese		
General Downgradient Conditions	General Site Conditions (Southwest area near MW-S10 & SB-S1)	Surface Soil	Lead, Manganese	Drainage of western areas of the property from western drainage ditch. May have been filled during stormwater re-routing in 1950s and 1970s.	Lead exceedances are likely due to site drainage from the western drainage ditch and filling activities during stormwater/flood control activities in the 1950s and 1970s. Low arsenic and manganese exceedances are likely due to natural/background conditions in soil/historic fill compared to an extremely stringent SHS.
		Subsurface Soil	Arsenic, Lead, Manganese		

TABLE 2-2
SUMMARY OF PRELIMINARY RESPONSE ACTIONS FROM THE CLEANUP WORK PLAN
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES INC. - GREENVILLE, PENNSYLVANIA

Media	Pathway	COCs	AOCs	Description	Proposed Cleanup Standard (s)	General Response Actions	Potential ARARS
Groundwater	Ingestion	Manganese, Arsenic	All AOCs	Site-wide	Non-Residential Nonuse Aquifer MSCs	Additional Studies to Certify Nonuse Aquifer Initiate Nonuse Aquifer Determination Additional Groundwater Monitoring Environmental Covenants	Hazardous Sites Cleanup Act
	Groundwater Transport	Manganese, Arsenic	AOC-S7	Mathey Run	Non-Residential Nonuse Aquifer MSCs	Initiate Nonuse Aquifer Determination Environmental Covenants	Hazardous Sites Cleanup Act, PA Clean Streams Law
Soils in Lead Impacted Areas	Direct Contact & Soil-to-Groundwater	All COCs	Former Disposal Areas				
			AOC-S1	"Old Ballfield"	Non-Residential Direct Contact MSCs for Surface Soil Non-Residential Nonuse Aquifer Soil-to-Groundwater MSCs or Background (based on non-impacted areas) for Subsurface Soils	Hazardous/Non-Hazardous Waste Characterization OnSite Containment, Site Access Controls Long-term Maintenance & Monitoring, Environmental Covenants	Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act, PA Clean Streams Law
			AOC-S11	Debris/Fill Area Adjacent to AOC-S1			
			AOC-S17	Sandblast Sand Fill Area			
			Former Operating Areas				
			AOC-S5	Former Pickling Area	Non-Residential Direct Contact MSCs for Surface Soil Non-Residential Nonuse Aquifer Soil-to-Groundwater MSCs or Background (based on non-impacted areas) for Subsurface Soils	Surface Soil Removal, Post Excavation Sampling, Waste Characterization OnSite or Offsite Disposal Backfill and Engineered Cover (Soil, Asphalt, Concrete)	Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act, PA Clean Streams Law
			AOC-S6A	Boiler/Power House-East Side			
			AOC-S6B	Boiler/Power House-North Side			
			AOC-S6	Former Paint Shop (also former RCRA tank storage area)			
			AOC-S19	Former Acid Filter Drainage Pond			
			AOC-S21	Former Plate Painting Yard (current South Yard)			
			Drainage Ditch/Surface Water Pathway Areas				
			AOC-S12	Western Drainage Ditch	Non-Residential Direct Contact MSCs for Surface Soil Non-Residential Nonuse Aquifer Soil-to-Groundwater MSCs or Background (based on non-impacted areas) for Subsurface Soils	Surface Soil Removal, Post Excavation Sampling, Waste Characterization OnSite or Offsite Disposal Backfill and Engineered Cover (Soil, Asphalt, Concrete)	Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act, PA Clean Streams Law
			General Downgradient	Southwestern Corner (SB-S1 & SB-MW10 Areas)			
			AOC-S18	Drainage Ditch South Fence Line			
Soils in VOC Impacted Areas	Exposure to Vapors	VOCs	AOC-S2	Former Paint Shop	Non-Residential Direct Contact MSCs for Surface Soil Non-Residential Nonuse Aquifer Soil-to-Groundwater MSCs or Site Specific for Subsurface Soils	Further Evaluation Additional Response Actions As Required	Clean Air Act and Air Pollution Control Act, Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act
			AOC-S3	Former Pickling Area		See AOC-S5 Above	
Soils in Other Areas	Direct Contact & Soil-to-Groundwater	All COCs	All Other AOCs	Site-Wide	Non-Residential Direct Contact MSCs for Surface Soil Non-Residential Nonuse Aquifer Soil-to-Groundwater MSCs or Background (based on non-impacted areas) for Subsurface Soils	No Further Action Based On Meeting Standard or by Utilizing 75/10 Rule	Hazardous Sites Cleanup Act
Sediment	Stormwater Runoff	Lead, Zinc	AOC-S4	"Old Erie Extension Canal"	Site-Specific	Further Evaluation Additional Response Actions As Required	Hazardous Sites Cleanup Act, PA Clean Streams Law
			AOC-S7	Mathey Run			

TABLE 4-1
SUMMARY OF SELECTED RESPONSE ACTIONS
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

Media	Pathway	COCs	AOCs	Description	Cleanup Standard(s)	General Response Actions	ARARS
Groundwater	Ingestion	Manganese, Arsenic	All AOCs	Site-Wide	Residential Used Aquifer MSCs or Background at Site Boundary	Additional Groundwater Monitoring, Environmental Covenants	Hazardous Sites Cleanup Act
	Groundwater Transport	Manganese, Arsenic	AOC-S7	Mathay Run	Pennsylvania Ambient Water Quality Criteria	Additional Surface Water Monitoring	Hazardous Sites Cleanup Act, PA Clean Streams Law
Soil/Historic Fill in Lead Impacted Areas	Direct Contact & Soil-to-Groundwater	All COCs	Former Operating Areas				
			AOC-S3	Former Pickling Area	Site Specific - Pathway Elimination	Soil Removal, Post Excavation Sampling, Waste Characterization On-Site Containment in Former Disposal Areas or Offsite Disposal at a Permitted Facility Backfill with Clean Fill and Pave with Asphalt Environmental Covenants (as necessary)	Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act, PA Clean Streams Law
			AOC-S6A	Boiler/Power House-East Side			
			AOC-S6B	Boiler/Power House-North Side			
			AOC-S8	Former Paint Shop (also former RCRA tank storage area)			
			AOC-S19	Former Acid Filter Drainage Pond			
			AOC-S21	Former Plate Painting Yard (current South Yard)			
			Drainage Ditch/Surface Water Pathway Areas				
			AOC-S12	Western Drainage Ditch	Site Specific - Pathway Elimination	Soil Removal, Post Excavation Sampling, Waste Characterization OnSite Containment in Former Disposal Areas or Offsite Disposal at a Permitted Facility Regrade to Promote Positive Drainage	Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act, PA Clean Streams Law
			General Downgradient	Southwestern Corner (SB-S1 & SBMW10 Areas)			
			AOC-S18	Drainage Ditch South Fence Line			
Soil/Historic Fill in VOC Impacted Areas	Exposure to Vapors	VOCs	AOC-S2	Former Paint Shop	Non-Residential Used Aquifer Soil-to-Groundwater MSCs	No Further Action Required Based on the Results of Vapor Intrusion Evaluation and by Utilizing 75/10 Rule	Clean Air Act and Air Pollution Control Act, Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act
			AOC-S3	Former Pickling Area	Site Specific - Pathway Elimination	See AOC-S3 Above	
Soil/Historic Fill in Other Areas	Direct Contact & Soil-to-Groundwater	All COCs	All Other AOCs	Site-Wide	Non-Residential Used Aquifer Soil-to-Groundwater MSCs and Pennsylvania Clean Fill Criteria	No Further Action Based On Meeting Standard or by Utilizing 75/10 Rule	Hazardous Sites Cleanup Act
Soils & Waste Material	Direct Contact & Soil-to-Groundwater	All COCs	Former Disposal Areas				
			AOC-S1	"Old Ballfield"	Site Specific - Pathway Elimination	Soil Removal to Eliminate Potential Hazardous Waste, Post Excavation Sampling, Offsite Disposal at a Permitted Facility Re-grade to Promote Positive Drainage and Contain Within Residual Waste Landfill Cap Site Access Controls, Long-term Maintenance & Monitoring, Environmental Covenants	Hazardous Sites Cleanup Act, PA Solid Waste Management Act, Resource Conservation and Recovery Act, PA Clean Streams Law
			AOC-S11	Debris/Fill Area Adjacent to AOC S1			
			AOC-S17	Sandblast Sand Fill Area			
Sediment	Direct Contact & Ecological Receptrors	Manganese, Arsenic	AOC-S4	"Old Erie Extension Canal"	Site-Specific - Not Applicable	No Further Action Based on the Results of Stormwater Drainage Investigations and Comparison with Urban Run-off	Hazardous Sites Cleanup Act, PA Clean Streams Law
			AOC-S7	Mathay Run			

TABLE 5-1
DEPTH TO COC EXCEEDENCES IN SOIL/HISTORIC FILL SAMPLES
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PENNSYLVANIA

Location	Areas of Concern (AOCs)	Borehole/ Test Pit	Depth to COC Exceedance (feet)	Constituents of Concern[1] (COCs)	Next Sample Depth with No Exceedances (feet)	Depth of TCLP Exceedance (feet)
Former Operating Areas	AOC-S21	SB-S19W2	0-2	Lead (>450 mg/kg)	5-7	—
		SB-S19	0-2	Lead (>450 mg/kg)	10-12	—
			4-6			
		SB-S19E	0-2	Lead (>450 mg/kg)	10-12	—
		SB-S19S	0-2	Lead (>450 mg/kg)	10-12	—
				Manganese (>2000 mg/kg)		
		SB-S19S2	0-2	Lead (>450 mg/kg)	4-6	—
		MB-S19W	0-2	Lead (>450 mg/kg)	10-12	—
				Manganese (>2,000 mg/kg)		
		GAI-S2	0-6	Lead (>450 mg/kg)	NA	0-6
		SW-S12	0-2	Lead (>450 mg/kg)	NA	—
		GAI-S3	0-2	Lead (>450 mg/kg)	NA	0-2
		GAI-S4	0-2	Lead (>450 mg/kg)	NA	0-2
		SB-S18	0-2	Lead (>450 mg/kg)	10-12	—
		SB-S18N1	0-2	Lead (>450 mg/kg)	6-8	—
	AOC-S3	SB-S8	0-2	Lead (>450 mg/kg)	14-16	—
		SB-S8S1	0-2	Lead (>450 mg/kg)	6-8	—
		GAI-S5	0-2	Lead (>450 mg/kg)	NA	—
		[redacted]	0-2	Antimony (>27 mg/kg)	13-15	—
				Lead (>450 mg/kg)		
				Manganese (>2,000 mg/kg)		
				Zinc (>12,000 mg/kg)		
		[redacted]	0-2	1,3,5-Trimethylbenzene (>9.3 mg/kg)	4-6 (VOCs/SVOCs/ Hexavalent Chromium)	—
				Hexavalent Chromium (>190 mg/kg)		
				Lead (>450 mg/kg)		
			2-4	1,2,4-Trimethylbenzene (>35 mg/kg)	12-14 (Manganese)	
				1,3,5-Trimethylbenzene (>9.3 mg/kg)		
				Naphthalene (>25 mg/kg)		
				Lead (>450 mg/kg)	NA (Lead)	
				Manganese (>2,000 mg/kg)		
			12-14	Lead (>450 mg/kg)		
			16-18	Lead (>450 mg/kg)		
		[redacted]	0-2	Naphthalene (>25 mg/kg)	4-6	—
				Lead (>450 mg/kg)		
				Manganese (>2,000 mg/kg)		
				Zinc (>12,000 mg/kg)		
			2-4	1,2,4-Trimethylbenzene (>35 mg/kg)		
				1,3,5-Trimethylbenzene (>9.3 mg/kg)		
				Naphthalene (>25 mg/kg)		
				Lead (>450 mg/kg)		
				Manganese (>2,000 mg/kg)		
		[redacted]	0-2	Lead (>450 mg/kg)	4-6	—
				Manganese (>2,000 mg/kg)		
				Zinc (>12,000 mg/kg)		
			2-4	1,2,4-Trimethylbenzene (>35 mg/kg)		
				1,3,5-Trimethylbenzene (>9.3 mg/kg)		
				Lead (>450 mg/kg)		
		[redacted]	0-18	Lead (>450 mg/kg)	NA	0-18
			3-4	1,2 Dibromo-3-chloropropane (>0.02 mg/kg)		
				1,2-Dibromoethane (>0.005 mg/kg)		
		SB-S9NE2	0-2	Lead (>450 mg/kg)	2-3	—
		SB-S9NE3	0-2	Lead (>450 mg/kg)	2-3	—
		SB-S9NE4	2-3	Lead (>450 mg/kg)	4-6	—
		SB-S9S1	0-2	Lead (>450 mg/kg)	5-7	—
		SB-S9SE1	0-2	Lead (>450 mg/kg)	4-6	—
		SB-S9SE3	0-2	Lead (>450 mg/kg)	NA	—
			4-6	Lead (>450 mg/kg)		
				Zinc (>12,000 mg/kg)		
	AOC-S19	GAI-S10	0-6	Lead (>450 mg/kg)	NA	—
		MW-S6	0-2	Lead (>450 mg/kg)	4-6	—
		SBMW-S6E1	0-2	Lead (>450 mg/kg)	6-8	—
			4-6			
		SBMW-S6N1	0-2	Lead (>450 mg/kg)	2-4	—
		SBMW-S6S1	0-2	Lead (>450 mg/kg)	4-6	—
	AOC-6A	GAI-S1	0-2	Lead (>450 mg/kg)	NA	—
		SB-S10S1	0-2	Lead (>450 mg/kg)	5-7	—
		SB-S10S2	0-2	Lead (>450 mg/kg)	2-3	—
	AOC-6B	SB-S20A	0-2	Lead (>450 mg/kg)	4-6	—
				Manganese (>2,000 mg/kg)		
		SB-S20B	0-2	Manganese (>2,000 mg/kg)	8-10	—

Checked by: BG

Golder Associates

TABLE 5-1
DEPTH TO COC EXCEEDENCES IN SOIL/HISTORIC FILL SAMPLES
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PENNSYLVANIA

Location	Areas of Concern (AOCs)	Borehole/ Test Pit	Depth to COC Exceedance (feet)	Constituents of Concern[1] (COCs)	Next Sample Depth with No Exceedances (feet)	Depth of TCLP Exceedance (feet)
Drainage Ditch/ Surface Water Pathway Areas	AOC-S12 Western Drainage Ditch	GAI-S12	0-1	Lead (>450 mg/kg)	NA	0-1
		SS-S10	Surface	Lead (>450 mg/kg)	NA	—
		SS-S10N2	Surface	Lead (>450 mg/kg)	NA	—
		SS-S10N3	Surface	Lead (>450 mg/kg)	NA	—
		SS-S10S3	Surface	Lead (>450 mg/kg)	NA	—
		SS-S10S4	0-0.5	Lead (>450 mg/kg)	0.5-1	—
	AOC-S18 Southern Drainage Ditch	SS-S7	Surface	Lead (>450 mg/kg)	NA	—
	General Downgradient SW1	GAI-S14	0-3	Lead (>450 mg/kg)	NA	—
		GAI-S15	0-2	Lead (>450 mg/kg)	NA	—
		SB-S1E1	0-2	Lead (>450 mg/kg)	NA	—
		SB-S1N2	0-2	Lead (>450 mg/kg)	4-6	—
		SB-S1N3	0-2 2-3	Lead (>450 mg/kg)	NA	—
		SB-S1N2E1	0-2 2-4	Lead (>450 mg/kg)	NA	—
		SB-S1S1	0-2	Lead (>450 mg/kg)	NA	—
		SB-S1S2	0-1.5	Lead (>450 mg/kg)	4-4.5	—
		SB-S1W1	0-2	Lead (>450 mg/kg)	NA	—
	General Downgradient SW2	GAI-S16	0-2	Lead (>450 mg/kg)	NA	0-2
		MW-S10	0-2	Lead (>450 mg/kg) Manganese (>2,000 mg/kg)	6-8 (Manganese)	—
			6-8	Lead (>450 mg/kg)	NA (Lead)	
		SBMW-S10W1	0-2	Lead (>450 mg/kg)	3-3.8	—
		SBMW-S10W2	0-2	Lead (>450 mg/kg)	2-4	—
Former Disposal Areas	AOC-S1	TP-S13	0-2	Manganese (>2,000 mg/kg)	4-6	—
			4-6	Dieldrin (>0.44 mg/kg)	9-11	
		TP-S14	0-2	Lead (>450 mg/kg) Hexavalent Chromium (>190 mg/kg)	3-5	—
		TP-S3	0-2	Manganese (>2,000 mg/kg)	6-7	—
			6-7	Lead (>450 mg/kg)	13-14	
		TP-S15	0-2 6-8	Manganese (>2,000 mg/kg)	11-12	—
		TP-S16	0-2	Lead (>450 mg/kg)	5-7	—
		TP-S2	13-15	Dieldrin (>0.44 mg/kg)	NA	—
		GAI-S29	0-10	Lead (>450 mg/kg)	NA	—
		TP-S17	0-2	Lead (>450 mg/kg) Manganese (>2000 mg/kg)	4-6	—
	AOC-S11	TP-S19	3-8	Manganese (>2000 mg/kg)	7-8	—
		GAI-S28	0-7	Lead (>450 mg/kg)	NA	—
		GAI-S27	0-8	Lead (>450 mg/kg)	NA	—
		TP-S5	0-2	Iron (>190,000 mg/kg)[2] Lead (>450 mg/kg) Manganese (>2,000 mg/kg) Nickel (>650 mg/kg)	8-9	—
		TP-S5B	0-2	Nickel (>650 mg/kg)	NA	—
		TP-S20	0-2 4-5	Lead (>450 mg/kg)	5-7	—
		GAI-S25	0-7	Lead (>450 mg/kg)	NA	0-7
		GAI-S26	0-7	Lead (>450 mg/kg)	NA	0-7
		TP-S21	3-5	Iron (>190,000 mg/kg)[2] Lead (>450 mg/kg) Manganese (>2,000 mg/kg) Nickel (>650 mg/kg)	5-7	—
		TP-S22	3-4	Lead (>450 mg/kg) Manganese (>2000 mg/kg)	5-7	—
		TP-S23	0-2	Lead (>450 mg/kg)	3-4	—
		TP-S24	0-2	Lead (>450 mg/kg) Manganese (>2,000 mg/kg) Mercury (>10 mg/kg)	2-4	—
		GAI-S23	0-8	Lead (>450 mg/kg)	NA	—
	AOC-S17	TP-S27	0-2	Lead (>450 mg/kg)	2-4	—
		TP-S28	0-2	Nickel (>650 mg/kg)	3-4.5	—
			3-4.5	Lead (>450 mg/kg)	5-7	
		TP-S10	3-4	Mercury (>10 mg/kg)	5-8	—
		GAI-S22	0-9	Lead (>450 mg/kg)	NA	—
Other		MW-S12	2-4	Arsenic (>29 mg/kg)	8-10	—
		SB-S11	0-2	Manganese (>2,000 mg/kg)	8-10	—
		SB-S16	0-2	Manganese (>2,000 mg/kg)	8-10	—
		SB-S28	0-2	Manganese (>2,000 mg/kg)	12-14	—

Notes:

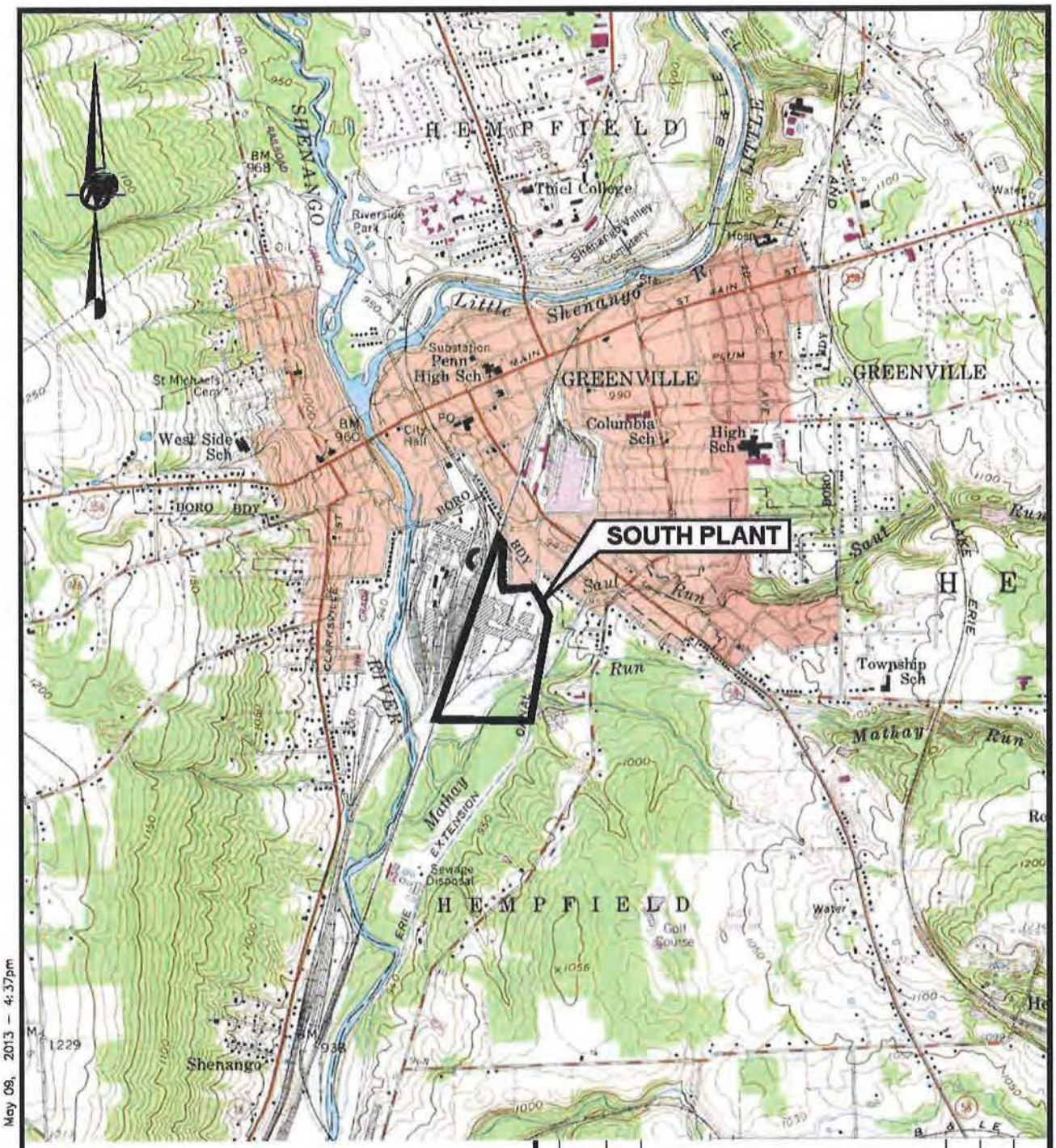
1. Results above the Pennsylvania Non-Residential Soil-to-Groundwater Media-Specific Concentration (MSC)
Pennsylvania Department of Environmental Protection (PADEP) MSCs source: PADEP Website
http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/10307/statewide_health_standard/552039
2. No Soil-to-Groundwater (MSCs) Available, but only the Direct Contact MSC
— = No TCLP Sample Taken
NA = Not Available

	2 Foot Excavation
	0- 2 Foot Surface Soil Removal
	4 Foot Excavation
	6 Foot Excavation
	8 Foot Excavation
	6 Foot Excavation and Insitu Stabilization, as necessary, from 6-20 feet

Checked by:BG

Gahler Associates

FIGURES



2000 0 2000

SCALE FEET

REFERENCE

1.) BASE MAP TAKEN FROM USGS 7.5 MINUTE SERIES QUADRANGLES OF GREENVILLE WEST AND GREENVILLE EAST, DATED 1958, PHOTOREVISED IN 1990 AND 1970 RESPECTIVELY.

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE

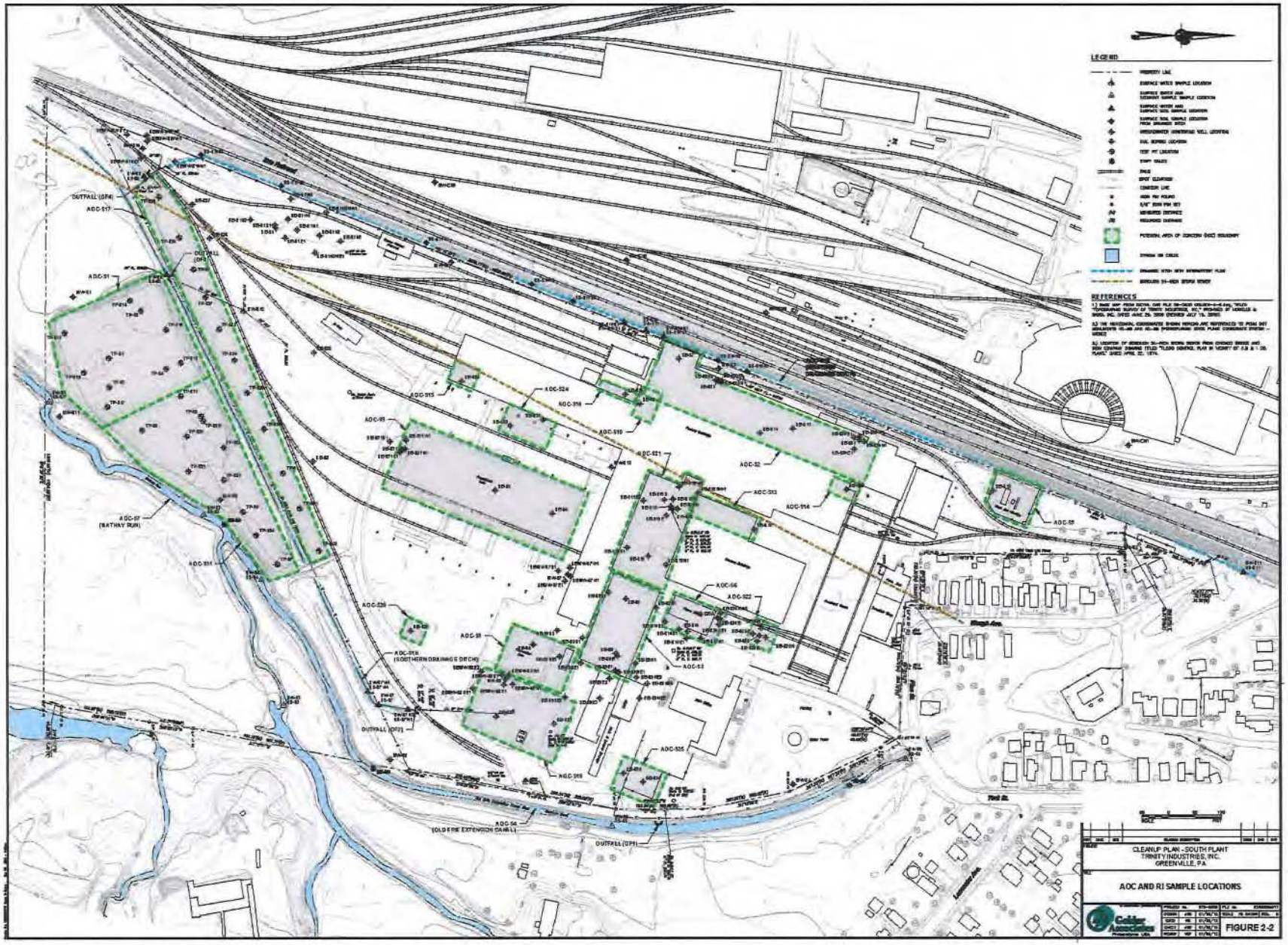
SITE LOCATION MAP

Golder Associates
Mt. Laurel, New Jersey

NJ Authorization #24GA28028100

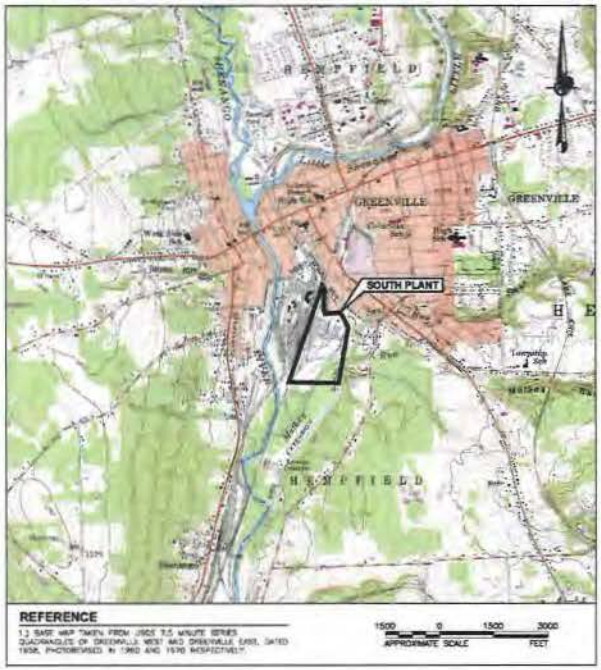
PROJECT No.		073-6009	FILE No.		0736009AB15
DESIGN	JBG	01/09/12	SCALE	AS SHOWN	REV. 0
CADD	RC	01/09/12	FIGURE 2-1		
CHECK	JBG	01/09/12			
REVIEW	VEF	01/09/12			

Drawing file: 0736009AB15 Figure 2-1.dwg May 09, 2013 - 4:37pm



TRINCBI 0039184

REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PENNSYLVANIA



DRAWING LIST

DRAWING No.	DRAWING TITLE
1	COVER SHEET
2	LAYOUT OF EXISTING CONDITIONS
3	LAYOUT OF PROPOSED REMEDY
4	EXTENT OF PROPOSED EXCAVATION AREAS
5	RESTORATION PLAN
6	EXCAVATION AREA AND RESTORATION PLAN DETAILS
7	FORMER DISPOSAL AREAS CAP GRADING PLAN
8	FORMER DISPOSAL AREAS CAP CROSS SECTIONS
9	FORMER DISPOSAL AREAS CAP DETAILS
10	FORMER DISPOSAL AREAS CHANNEL DETAILS
11	FORMER DISPOSAL AREAS STORMWATER BASIN DETAILS (SHEET 1 OF 2)
12	FORMER DISPOSAL AREAS STORMWATER BASIN DETAILS (SHEET 2 OF 2)
13	MISCELLANEOUS DETAILS
14	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
15	TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS (SHEET 1 OF 2)
16	TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS (SHEET 2 OF 2)

Prepared by:

Golder Associates

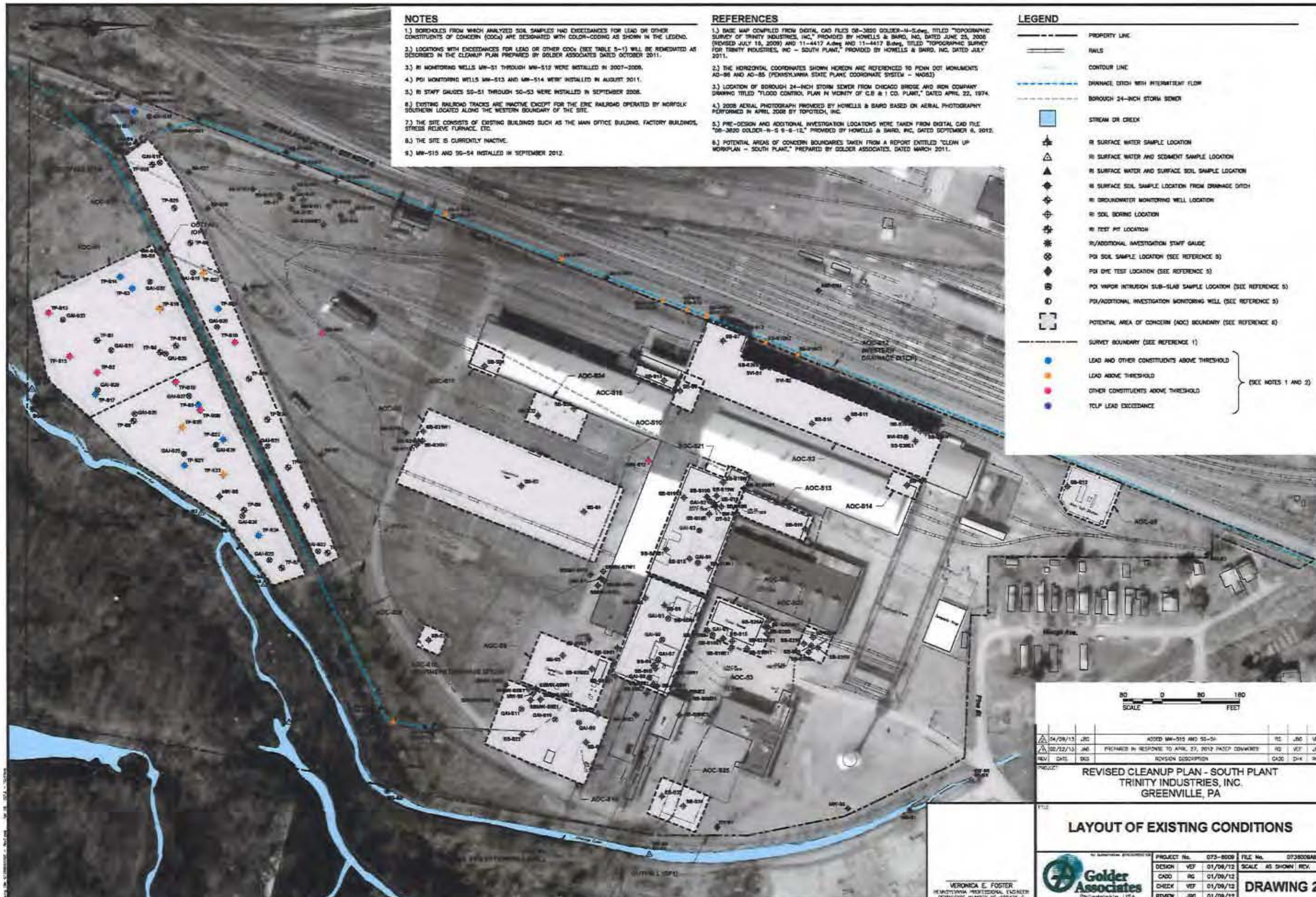
200 Century Parkway, Suite C
Mt. Laurel, New Jersey 08054
(856) 793-2005 www.golder.com

PROJECT No. 073-6009.100

FEBRUARY 2013

DRAWING 1

TRINCBI 0039185



NOTES

1.) BOREHOLES FROM WHICH ANALYZED SOIL SAMPLES HAD EXCEEDANCES FOR LEAD OR OTHER CONSTITUENTS OF CONCERN (COCs) ARE DESIGNATED WITH COLOR-CODING AS SHOWN IN THE LEGEND.

2.) LOCATIONS WITH EXCEEDANCES FOR LEAD OR OTHER COCs (SEE TABLE 5-1) WILL BE REMEDIATED AS DESCRIBED IN THE CLEANUP PLAN PREPARED BY GOLDER ASSOCIATES DATED OCTOBER 2011.

3.) RI MONITORING WELLS MW-S1 THROUGH MW-S12 WERE INSTALLED IN 2007-2009.

4.) PDI MONITORING WELLS MW-S13 AND MW-S14 WERE INSTALLED IN AUGUST 2011.

5.) RI STAFF GAUGES SG-S1 THROUGH SG-S3 WERE INSTALLED IN SEPTEMBER 2008.

6.) EXISTING RAILROAD TRACKS ARE INACTIVE EXCEPT FOR THE ERIE RAILROAD OPERATED BY NORFOLK SOUTHERN LOCATED ALONG THE WESTERN BOUNDARY OF THE SITE.

7.) THE SITE CONSISTS OF EXISTING BUILDINGS SUCH AS THE MAIN OFFICE BUILDING, FACTORY BUILDINGS, STRESS RELIEVE FURNACE, ETC.

8.) THE SITE IS CURRENTLY INACTIVE.

9.) MW-S15 AND SG-S4 INSTALLED IN SEPTEMBER 2012.

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 16, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AD-86 AND AD-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) 2008 AERIAL PHOTOGRAPH PROVIDED BY HOWELLS & BAIRD BASED ON AERIAL PHOTOGRAPHY PERFORMED IN APRIL 2008 BY TOPOTECH, INC.

5.) PRE-DESIGN AND ADDITIONAL INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-N-S 9-6-12," PROVIDED BY HOWELLS & BAIRD, INC, DATED SEPTEMBER 6, 2012.

6.) POTENTIAL AREAS OF CONCERN BOUNDARIES TAKEN FROM A REPORT ENTITLED "CLEAN UP WORKPLAN - SOUTH PLANT," PREPARED BY GOLDER ASSOCIATES, DATED MARCH 2011.

LEGEND

- PROPERTY LINE
- RAILS
- CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- STREAM OR CREEK
- RI SURFACE WATER SAMPLE LOCATION
- RI SURFACE WATER AND SEDIMENT SAMPLE LOCATION
- RI SURFACE WATER AND SURFACE SOIL SAMPLE LOCATION
- RI SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- RI GROUNDWATER MONITORING WELL LOCATION
- RI SOIL BORING LOCATION
- RI TEST PIT LOCATION
- RI/ADDITIONAL INVESTIGATION STAFF GAUGE
- PDI SOIL SAMPLE LOCATION (SEE REFERENCE 5)
- PDI DYE TEST LOCATION (SEE REFERENCE 5)
- PDI VAPOR INTRUSION SUB-SLAB SAMPLE LOCATION (SEE REFERENCE 5)
- PDI/ADDITIONAL INVESTIGATION MONITORING WELL (SEE REFERENCE 5)
- POTENTIAL AREA OF CONCERN (AOC) BOUNDARY (SEE REFERENCE 6)
- SURVEY BOUNDARY (SEE REFERENCE 1)
- LEAD AND OTHER CONSTITUENTS ABOVE THRESHOLD
- LEAD ABOVE THRESHOLD
- OTHER CONSTITUENTS ABOVE THRESHOLD
- TCLP LEAD EXCEEDANCE

(SEE NOTES 1 AND 2)

80 0 80 160
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
△	04/09/13	JBG	ADDED MW-S15 AND SG-S4	RG	JBG	VEF
△	02/22/13	JAB	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VEF	JBG

PROJECT
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

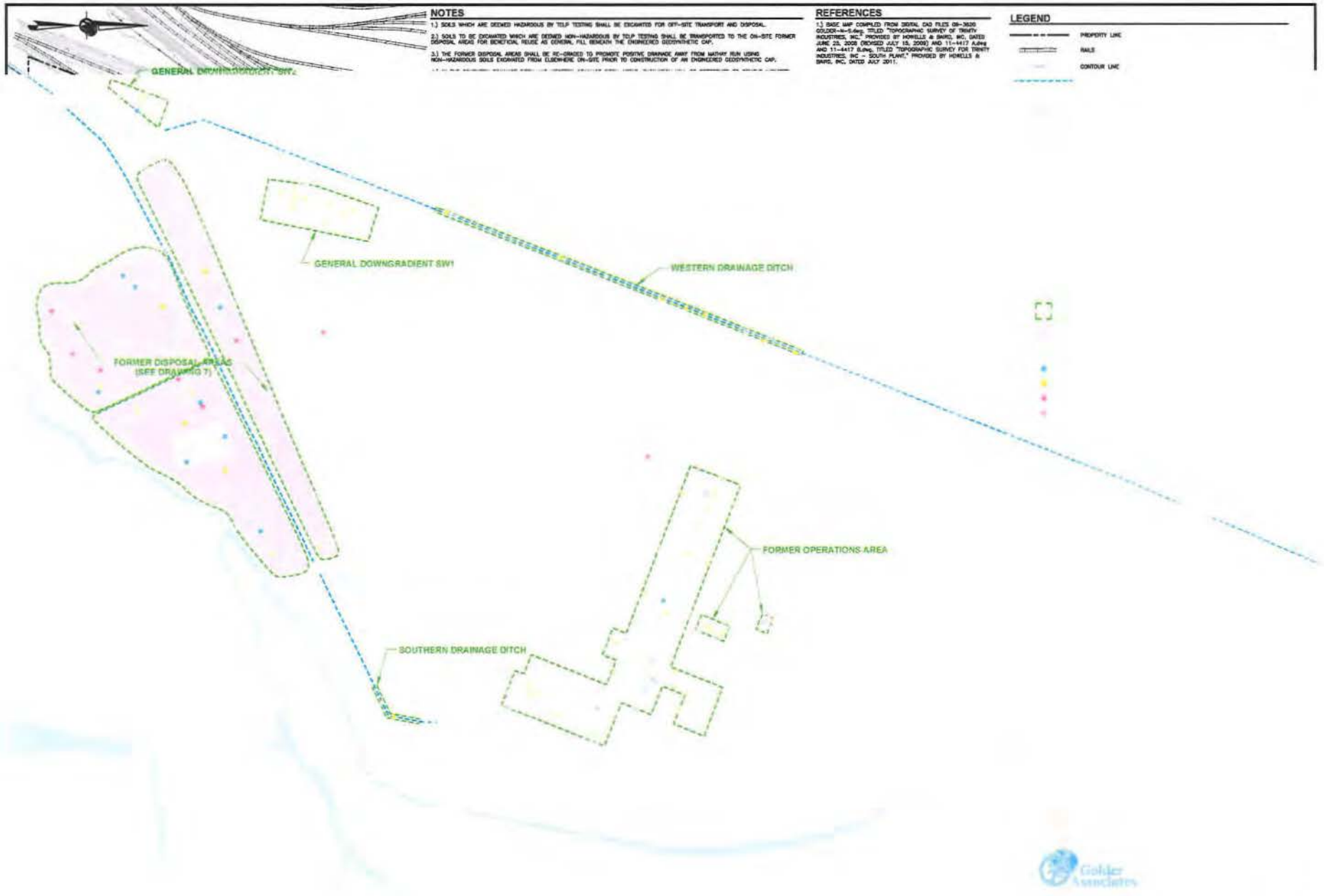
TITLE
LAYOUT OF EXISTING CONDITIONS

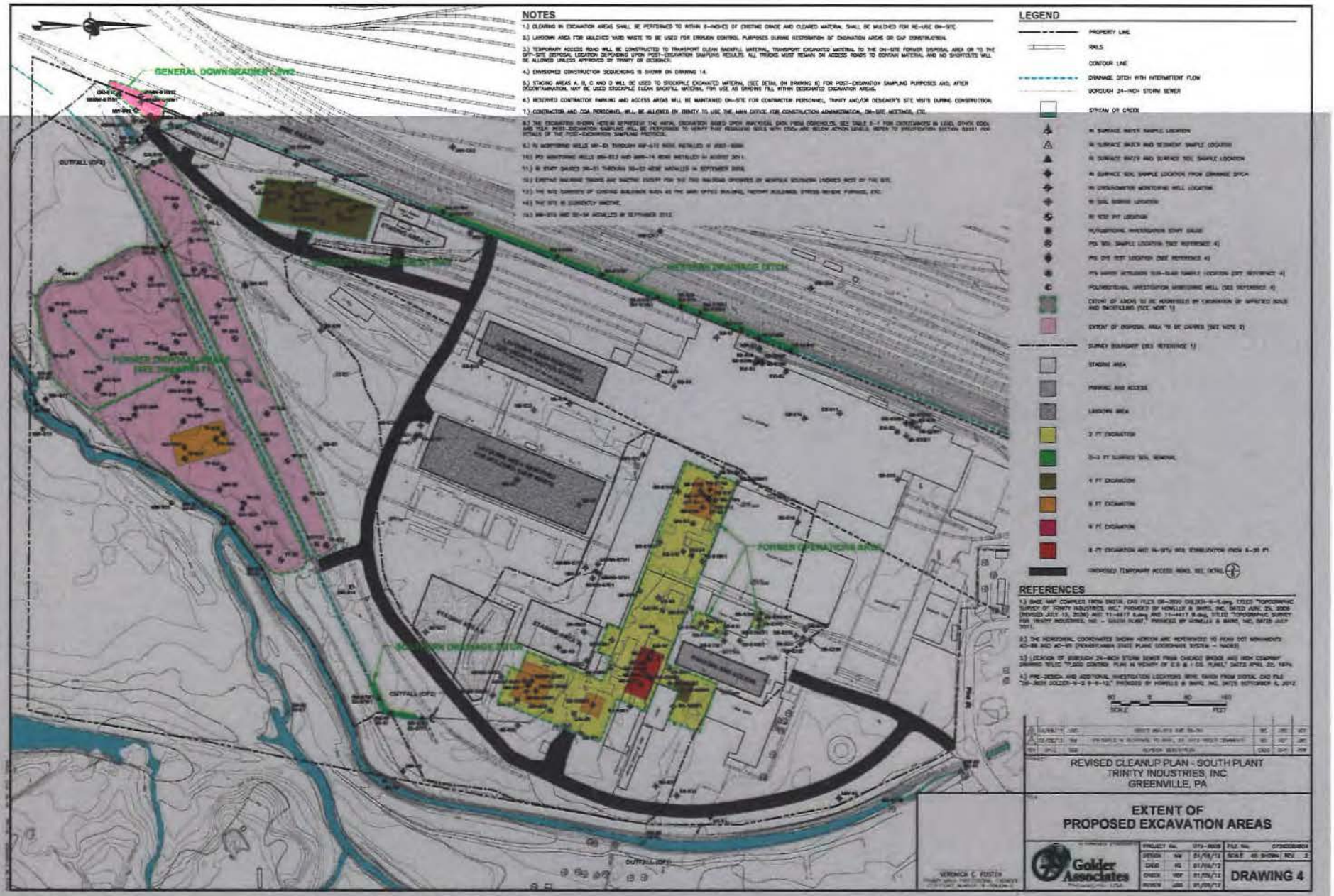
VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-055426-E

Golder Associates
Philadelphia USA

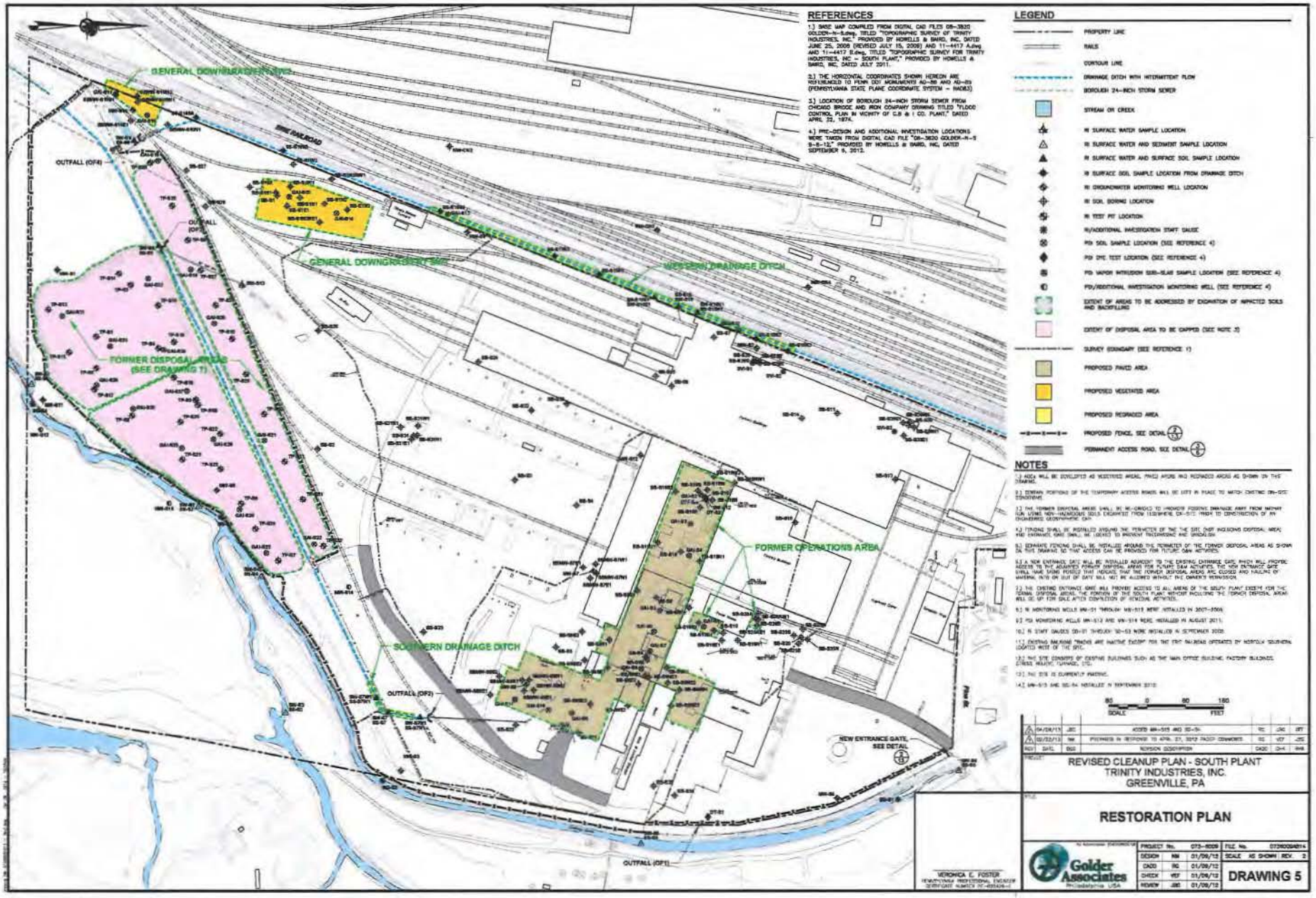
PROJECT No.		073-8009	FILE No.	0738009A002
DESIGN	VEF	01/09/12	SCALE AS SHOWN	REV. 2
CADD	RG	01/09/12	DRAWING 2	
CHECK	VEF	01/09/12		
REVIEW	JBG	01/09/12		

TRINCBI 0039186


NOTES
1.) SOILS WHICH ARE DEEMED HAZARDOUS BY TCLP TESTING SHALL BE EXCAVATED FOR OFF-SITE TRANSPORT AND DISPOSAL.
2.) SOILS TO BE EXCAVATED WHICH ARE DEEMED NON-HAZARDOUS BY TCLP TESTING SHALL BE TRANSPORTED TO THE ON-SITE FORMER DISPOSAL AREAS FOR BENEFICIAL REUSE AS GENERAL FILL BENEATH THE ENGINEERED GEOSYNTHETIC CAP.
3.) THE FORMER DISPOSAL AREAS SHALL BE RE-GRADED TO PROMOTE POSITIVE DRAINAGE AWAY FROM NATHAY RUN USING NON-HAZARDOUS SOILS EXCAVATED FROM ELSEWHERE ON-SITE PRIOR TO CONSTRUCTION OF AN ENGINEERED GEOSYNTHETIC CAP.
REFERENCES
1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 09-3620 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC." PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 23, 2008 (REVISED JULY 15, 2008) AND 11-4417 S.dwg AND 11-4417 S.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.
LEGEND
PROPERTY LINE
RAILS
CONTOUR LINE
GENERAL DOWNGRADIENT SW1
WESTERN DRAINAGE DITCH
FORMER DISPOSAL AREAS
(SEE DRAWING 7)
FORMER OPERATIONS AREA
SOUTHERN DRAINAGE DITCH
Golder Associates
TRINCBI 0038187



TRINCBI 0039188



REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES DR-3825 GOLDEN-N-5.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC." PROVIDED BY HOWELLS & BAIRD, INC. DATED JUNE 25, 2009 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC. DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE ESTABLISHED TO PENN DOT MONUMENTS AG-86 AND AG-89 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN AND ADDITIONAL INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "DR-3820 GOLDER-N-5 9-5-12." PROVIDED BY HOWELLS & BAIRD, INC. DATED SEPTEMBER 5, 2012.

LEGEND

- PROPERTY LINE
- RAILS
- CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- STREAM OR CREEK
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER AND SEDIMENT SAMPLE LOCATION
- SURFACE WATER AND SURFACE SOIL SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- ADDITIONAL INVESTIGATION STAFF GAUGE
- PDI SOIL SAMPLE LOCATION (SEE REFERENCE 4)
- PDI SVE TEST LOCATION (SEE REFERENCE 4)
- PDI VAPOR INTRUSION SUB-SLAB SAMPLE LOCATION (SEE REFERENCE 4)
- PDI ADDITIONAL INVESTIGATION MONITORING WELL (SEE REFERENCE 4)
- EXTENT OF AREAS TO BE ADDRESSED BY EXCAVATION OF IMPACTED SOILS AND BACKFILLING
- EXTENT OF DISPOSAL AREA TO BE CAPPED (SEE NOTE 3)
- SURVEY BOUNDARY (SEE REFERENCE 1)
- PROPOSED PAVED AREA
- PROPOSED VEGETATED AREA
- PROPOSED REGRADED AREA
- PROPOSED FENCE, SEE DETAIL
- PERMANENT ACCESS ROAD, SEE DETAIL

NOTES

1.) AREAS WILL BE DEVELOPED AS VEGETATED AREAS, PAVED AREAS AND REGRADED AREAS AS SHOWN ON THIS DRAWING.

2.) CERTAIN PORTIONS OF THE TEMPORARY ACCESS ROADS WILL BE LEFT IN PLACE TO MATCH EXISTING ON-SITE CONDITIONS.

3.) THE FORMER DISPOSAL AREAS SHALL BE RE-GRADED TO PROMOTE POSITIVE DRAINAGE AWAY FROM INITIAL RUN USING NON-HAZARDOUS SOILS EXCAVATED FROM LOCATIONS ON-SITE PRIOR TO CONSTRUCTION OF AN ENGINEERED GEOSYNTHETIC CAP.

4.) FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE THE SITE (NOT INCLUDING DISPOSAL AREA) AND ENTRANCE GATE SHALL BE LOCKED TO PREVENT TRESPASSING AND VANDALISM.

5.) SEPARATE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE FORMER DISPOSAL AREAS AS SHOWN ON PLOT DRAWING SO THAT ACCESS CAN BE PROVIDED FOR FUTURE O&M ACTIVITIES.

6.) A NEW ENTRANCE GATE WILL BE INSTALLED ADJACENT TO THE EXISTING ENTRANCE GATE WHICH WILL PROVIDE ACCESS TO THE ADJACENT FORMER DISPOSAL AREAS FOR FUTURE O&M ACTIVITIES. THE NEW ENTRANCE GATE SHALL HAVE SIGNS POSTED THAT INDICATE THAT THE FORMER DISPOSAL AREAS ARE CLOSED AND HAULING OF MATERIAL INTO OR OUT OF SITE WILL NOT BE ALLOWED WITHOUT THE OWNER'S PERMISSION.

7.) THE EXISTING ENTRANCE GATE WILL PROVIDE ACCESS TO ALL AREAS OF THE SOUTH PLANT EXCEPT FOR THE FORMAL DISPOSAL AREAS. THE PORTION OF THE SOUTH PLANT WITHOUT INCLUDING THE FORMER DISPOSAL AREAS WILL BE UP FOR SALE AFTER COMPLETION OF REMEDIAL ACTIVITIES.

8.) 16 MONITORING WELLS MW-01 THROUGH MW-015 WERE INSTALLED IN 2007-2008.

9.) PDI MONITORING WELLS MW-512 AND MW-514 WERE INSTALLED IN AUGUST 2011.

10.) 16 STAFF GAUGES SG-01 THROUGH SG-03 WERE INSTALLED IN SEPTEMBER 2008.

11.) EXISTING RAILROAD TRACKS ARE INACTIVE EXCEPT FOR THE SPOT RAILROAD OPERATED BY NORFOLK SOUTHERN LOCATED WEST OF THE SITE.

12.) THE SITE CONSISTS OF EXISTING BUILDINGS SUCH AS THE MAIN OFFICE BUILDING, FACTORY BUILDINGS, STORAGE WAREHOUSE, TURNPIKE, ETC.

13.) THE SITE IS CURRENTLY PAVED.

14.) MW-513 AND SG-04 INSTALLED IN SEPTEMBER 2012.

SCALE: 80 0 80 160 FEET

2	09/28/12	JEC	ADDED MW-515 AND SG-04	TC	JJC	VEF
1	02/22/12	NM	REVISIONS IN RESPONSE TO APR. 27, 2012 PADEP COMMENTS	TC	VEF	JJC
NO.	DATE	BY	REVISION DESCRIPTION	CHKD	QA/C	APP'D

PROJECT: REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

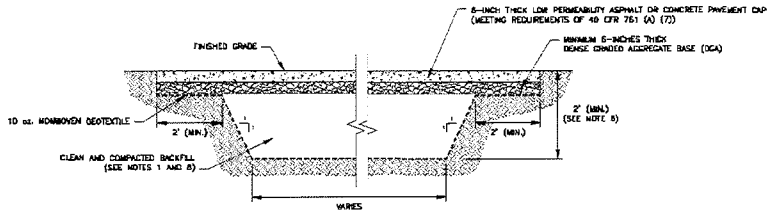
TITLE: **RESTORATION PLAN**

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-055436-E

Golder Associates
Philadelphia USA

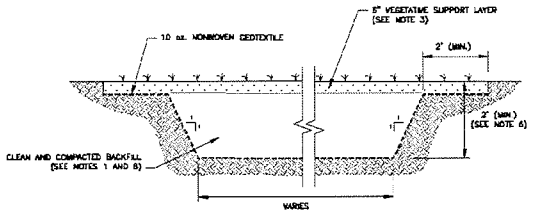
PROJECT No.	073-6009	FILE No.	073600904
DESIGN	NM	01/09/12	SCALE AS SHOWN REV. 2
CADD	BG	01/09/12	DRAWING 5
CHECK	VEF	01/09/12	
REVIEW	JJC	01/09/12	

TRINCBI 0039188



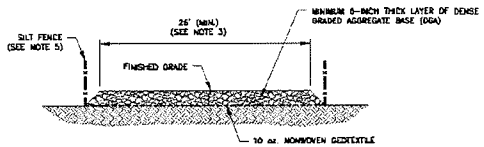
1/6 EXCAVATION AND BACKFILL DETAIL FOR PAVED AREA

NOT TO SCALE



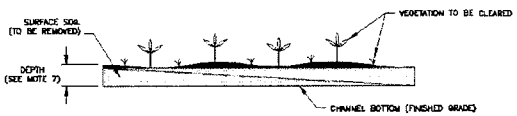
2/6 EXCAVATION AND BACKFILL DETAIL FOR VEGETATED AREA

NOT TO SCALE



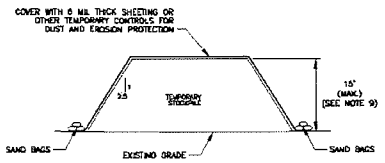
3/6 TEMPORARY AND PERMANENT ACCESS ROAD DETAIL

NOT TO SCALE



4/6 SURFACE SOIL REMOVAL AREA DETAIL

NOT TO SCALE



5/6 TEMPORARY STOCKPILE DETAIL

NOT TO SCALE

NOTES

1.) REFER TO SPECIFICATION SECTION 02223 FOR MATERIAL GRADATION, COMPACTION AND BACKFILL REQUIREMENTS.

2.) VEGETATIVE SUPPORT LAYER OR ALTERNATIVE LAYER COMPLYING WITH PERFORMANCE STANDARDS UNDER 25PA 288.234(a) AND APPROVED BY AGENCIES AS PROVIDED FOR UNDER THE EQUIVALENCY REVIEW PROCEDURE IN 25 PA. CHAPTER 287.231.

3.) A MINIMUM 25 FEET WIDE TEMPORARY ACCESS ROAD IS PROPOSED TO BE CONSTRUCTED DURING REMEDIATION HOWEVER THE EXACT WIDTH OF THE ROAD SHALL BE ADJUSTED TO FIT FIELD CONDITIONS.

4.) STOCKPILE DETAIL SHALL BE FOLLOWED TO STAGE BOTH EXCAVATED MATERIAL AND CLEAN BACKFILL MATERIAL ON-SITE.

5.) SILT FENCE WILL BE CONSTRUCTED ON BOTH SIDES AND ALONG THE ENTIRE LENGTH OF THE TEMPORARY ACCESS ROAD TO CONTAIN THE EXCAVATED MATERIAL TRANSPORTED TO THE ON-SITE DISPOSAL AREA FROM THE AOCs.

6.) DEPTH OF EXCAVATION VARIES DEPENDING UPON COC EXCEEDANCES SEEN IN TABLE 5-1 FOR VARIOUS LOCATIONS AND ALSO POST EXCAVATION SAMPLING RESULTS. REFER TO DRAWING 4 FOR EXCAVATION DEPTHS.

7.) DEPTH OF SURFACE SOIL TO BE REMOVED DEPENDS UPON COC EXCEEDANCES, AS SEEN IN TABLE 5-1, FOR WESTERN AND SOUTHERN DRAINAGE DITCH AREAS AND, POST EXCAVATION SAMPLING RESULTS.

8.) THE EXCAVATION CUT SLOPES WILL BE SLOPED 1HSTV (OSHA) AS SHOWN IN DETAIL 1 AND DETAIL 2. HOWEVER, DEPENDING UPON FIELD CONDITIONS, THE COMPETENT PERSON PROVIDING ON-SITE EXCAVATION OVERSIGHT WILL DETERMINE THE REQUIRED SIDE SLOPES BASED ON OSHA SUBPART P 29CFR 1926.652 (REQUIREMENTS FOR EXCAVATION PROTECTIVE SYSTEMS) TO ENSURE SAFETY OF ALL PERSONNEL WORKING ON-SITE.

9.) THE STOCKPILE SIDE SLOPES AND HEIGHT SHALL BE DEPENDENT UPON OSHA REQUIREMENTS AND MATERIAL TYPE, BUT SHALL NOT EXCEED THE VALUES STIPULATED ON DETAIL 5.

REV	DATE	DES	REVISION DESCRIPTION	CHKD	CHK	APVD
1	02/22/13	NM	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VEF	JBG

PROJECT

REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE

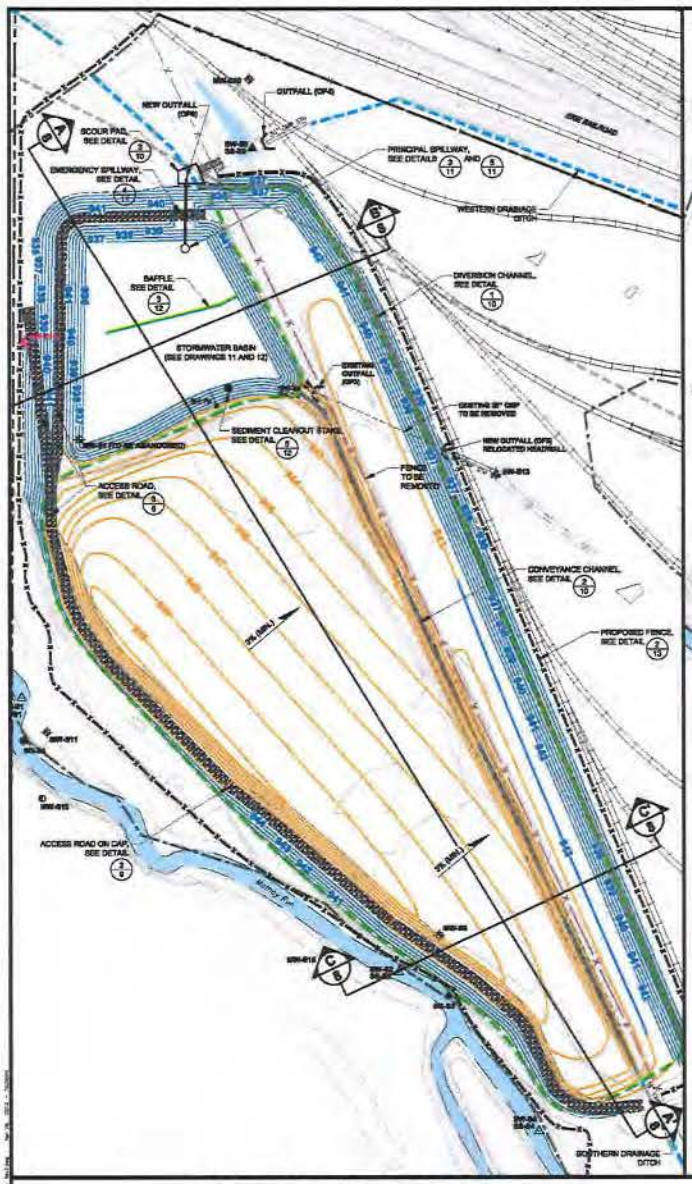
EXCAVATION AREA AND RESTORATION PLAN DETAILS

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065479-E

Golder Associates
Mt Laurel, New Jersey

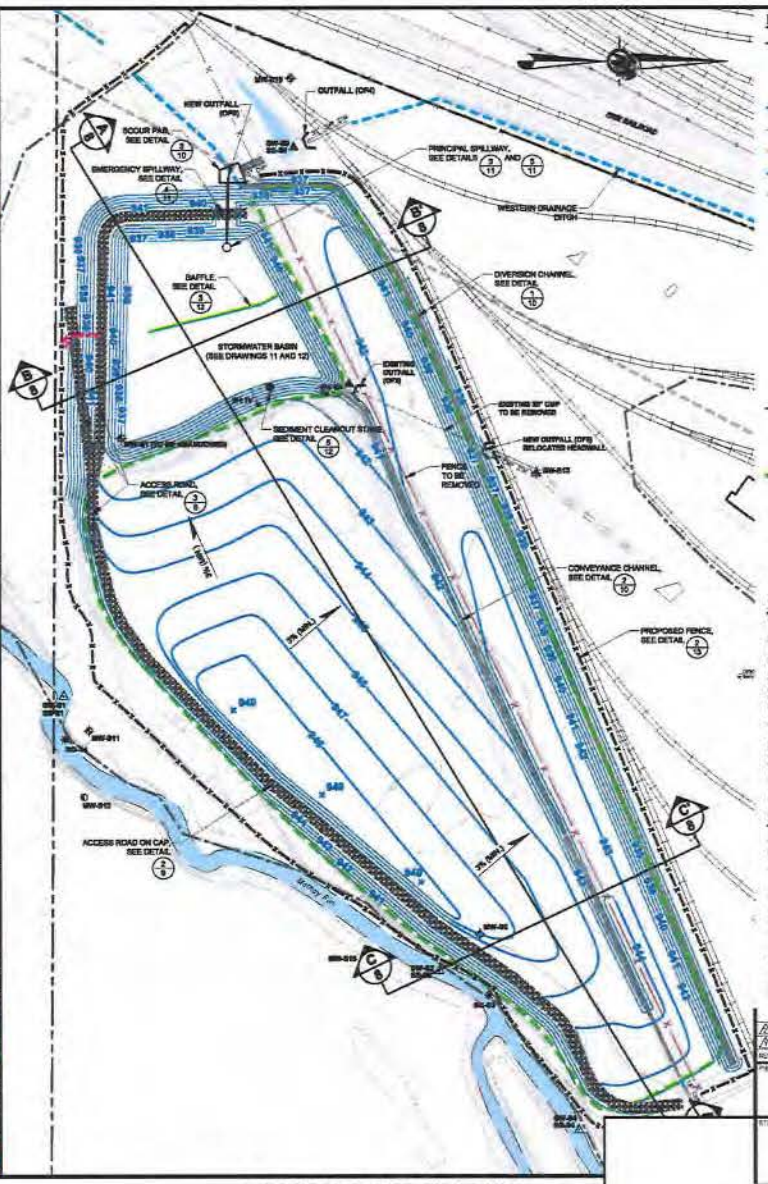
PROJECT No.	073-6009	FILE No.	073600MA005
DESIGN	NM	01/09/12	SCALE AS SHOWN REV. 1
DRAD	RG	01/09/12	
CHECK	VEF	01/09/12	DRAWING 6
REVIEW	JBG	01/09/12	

TRINCBI 0039190



ALTERNATE CAP GRADING

SCALE 50 0 50 100 FEET



PROPOSED CAP GRADING

SCALE 50 0 50 100 FEET

LEGEND

- PROPERTY LINE
- RAILS
- EXISTING CONTOUR LINE
- 942 PROPOSED FINAL CAP CONTOURS (SEE NOTE 3)
- 942 PROPOSED SURFACE WATER MANAGEMENT CONTOURS
- ALTERNATE CAP CONTOURS (SEE NOTE 3)
- EXISTING DRAINAGE DITCH (INTERMITTENT FLOW)
- BOROUGH 24-INCH STORM SEWER
- STREAM OR CREEK
- RI SURFACE WATER SAMPLE LOCATION
- RI SURFACE WATER AND SEDIMENT SAMPLE LOCATION
- RI SURFACE WATER AND SURFACE SOIL SAMPLE LOCATION
- RI GROUNDWATER MONITORING WELL LOCATION
- RI/ADDITIONAL INVESTIGATION STAFF GAUGE
- RDI/ADDITIONAL INVESTIGATION MONITORING WELL (SEE REFERENCE 5)
- SURVEY BOUNDARY (SEE REFERENCE 1)
- ACCESS ROAD, SEE DETAIL OR
- LIMIT OF DISPOSAL AREA CAP
- NEW MONITORING WELL, SEE DETAIL
- EXISTING FENCE TO REMAIN
- EXISTING FENCE TO BE REMOVED
- PROPOSED FENCE, SEE DETAIL
- PROPOSED STORMWATER DRAINAGE CHANNEL

NOTES

1.) MW-S10, MW-S11, AND MW-S12 INSTALLED IN FEBRUARY 2009.

2.) STAFF GAUGES SG-S1, SG-S2, AND SG-S3 INSTALLED IN SEPTEMBER 2008.

3.) TWO GRADING PLAN OPTIONS ARE SHOWN FOR THE FINAL CONTOURING OF THE FORMER DISPOSAL AREAS CAP COVER SYSTEM. THE PROPOSED PLAN PROVIDES APPROXIMATELY 7,000 CUBIC YARDS OF NET FILL CAPACITY FOR RELOCATED IMPACTED SOILS, WHICH IS ADEQUATE STORAGE FOR THE ANTICIPATED VOLUMES. THE ALTERNATE PLAN PROVIDES ADDITIONAL FILL CAPACITY (FOR A TOTAL OF APPROXIMATELY 15,000 CUBIC YARDS) IN THE EVENT THAT POST-EXCAVATION SAMPLING OF EXCAVATION AREAS DICTATES ADDITIONAL REMOVAL AND ON-SITE DISPOSAL OF IMPACTED SOILS.

4.) RELOCATED MW-S1 TO ACCOMMODATE STORMWATER BASIN.

5) THE GRADING PLANS PRESENTED ON THIS DRAWING ARE SUBJECT TO CHANGE AS THEY ARE BASED ON ANTICIPATED VOLUMES OF EXCAVATED IMPACTED SOILS TO BE RELOCATED UNDER THE FORMER DISPOSAL AREAS CAP. FINAL VOLUMES OF RELOCATED SOIL WILL BE DETERMINED ONCE POST-EXCAVATION SAMPLING OF EXCAVATION AREAS IS COMPLETED. UPON COMPLETION OF POST-EXCAVATION SAMPLING, A FINAL REVISED GRADING PLAN WILL BE PRODUCED BASED ON THESE TOTAL VOLUMES.

6.) MW-S15 AND SG-S4 INSTALLED IN SEPTEMBER 2012.

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3826 GOLDER-M-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC." PROVIDED BY HOWELLS & BAIRD, INC. DATED JUNE 26, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC – SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC. DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AD-88 AND AD-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM – NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B. & I CO. PLANT," DATED APRIL 22, 1974.

4.) 2008 AERIAL PHOTOGRAPH PROVIDED BY HOWELLS & BAIRD BASED ON AERIAL PHOTOGRAPHY PERFORMED IN APRIL 2008 BY TOPOTECH, INC.

5.) PRE-DECISION AND ADDITIONAL INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-M-S 9-6-12." PROVIDED BY HOWELLS & BAIRD, INC. DATED SEPTEMBER 6, 2012.

MK	DATE	DES	REVISION DESCRIPTION	QA/QC	CHK	APP
2	04/26/13	JBC	ADDED MW-S15 AND SG-S4	RC	JAB	VEF
1	02/22/13	JBC	PREPARED IN RESPONSE TO APRIL 27, 2012 EPA/DEP COMMENTS	RC	VEF	JBC

PROJECT: REVISED CLEAN UP PLAN
SOUTH PLANT - TRINITY INDUSTRIES, INC.
GREENVILLE, PA

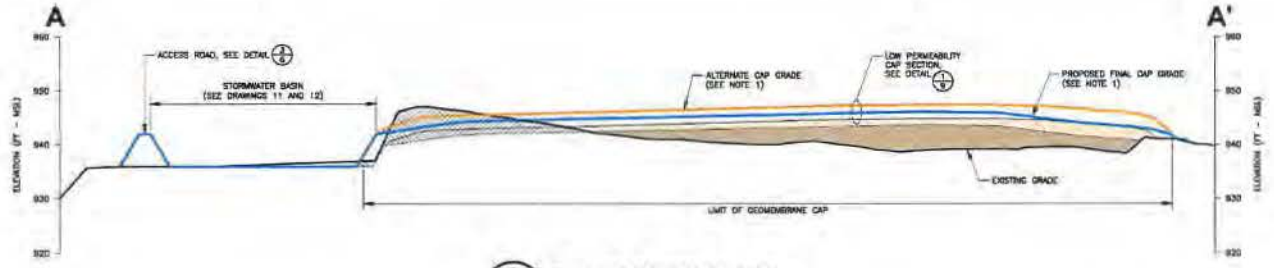
TITLE: **FORMER DISPOSAL AREAS CAP GRADING PLAN**

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-079436-E

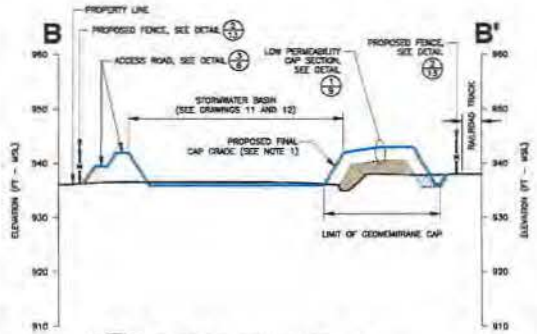
Golder Associates
NJ, Cherry Hill, New Jersey

PROJECT No.		073-9009	FILE No. 073900881B
DESIGN	JAB	01/09/12	SCALE AS SHOWN REV. 2
CADD	RC	01/09/12	
CHECK	VEF	01/09/12	DRAWING 7
REVIEW	JBC	01/09/12	

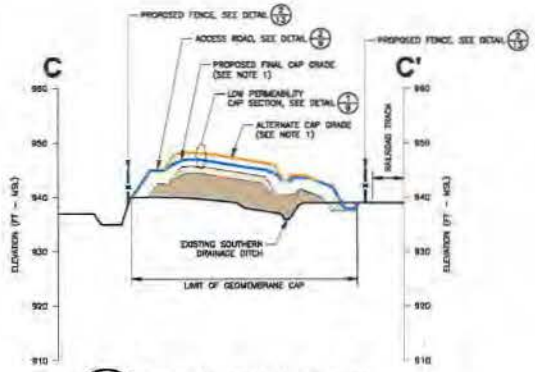
TRINCBI 0039191



A/8 CROSS SECTION A-A'



B/8 CROSS SECTION B-B'



C/8 CROSS SECTION C-C'

LEGEND

- EXISTING GRADE
- PROPOSED FINAL CAP GRADE (SEE NOTE 1)
- ALTERNATE CAP GRADE (SEE NOTE 1)
- VOLUME OF RELOCATED IMPACTED SOILS
- ADDITIONAL VOLUME OF RELOCATED IMPACTED SOILS
- MATERIALS RELOCATED WITHIN THE FORMER DISPOSAL AREA

NOTE

1.) TWO GRADING PLAN OPTIONS ARE SHOWN FOR THE FINAL CONTOURING OF THE FORMER DISPOSAL AREAS CAP COVER SYSTEM. THE PROPOSED PLAN PROVIDES APPROXIMATELY 7,000 CUBIC YARDS OF NET FILL CAPACITY FOR RELOCATED IMPACTED SOILS, WHICH IS ADEQUATE STORAGE FOR THE ANTICIPATED VOLUMES. THE ALTERNATE PLAN PROVIDES ADDITIONAL FILL CAPACITY (FOR A TOTAL OF APPROXIMATELY 15,000 CUBIC YARDS) IN THE EVENT THAT POST-EXCAVATION SAMPLING OF EXCAVATION AREAS DICTATES ADDITIONAL REMOVAL AND ON-SITE DISPOSAL OF IMPACTED SOILS.

REFERENCE

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC." PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2008) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

50 0 50 100
HORIZONTAL SCALE FEET

15 0 15 30
VERTICAL SCALE FEET

VERTICAL EXAGGERATION X5

REV	DATE	BY	REVISION DESCRIPTION	CHKD	DES	APP
1	02/02/12	VEF	REVISIONS IN RESPONSE TO APRIL 27, 2012 TRUST COMMENTS	RG	VEF	JBG

REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

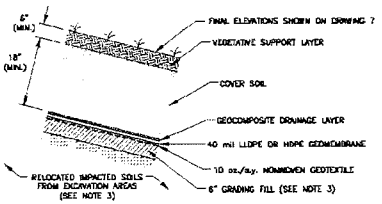
FORMER DISPOSAL AREAS CAP CROSS SECTIONS

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065448-E

Golder Associates
MT. LAUREL, NEW JERSEY

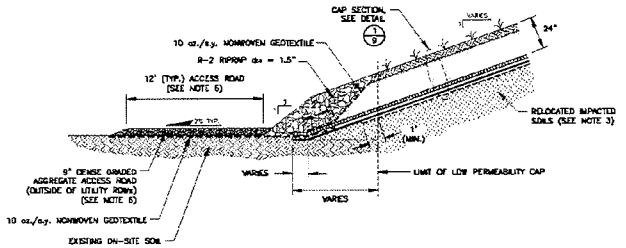
PROJECT No.	073-6009	FILE No. 073602094021
DESIGN	VEF 01/09/12	SCALE: AS SHOWN REV. 1
CADD	RG 01/09/12	
CHECK	VEF 01/09/12	DRAWING 8
REVIEW	JBG 01/09/12	

TRINCBI 0039182



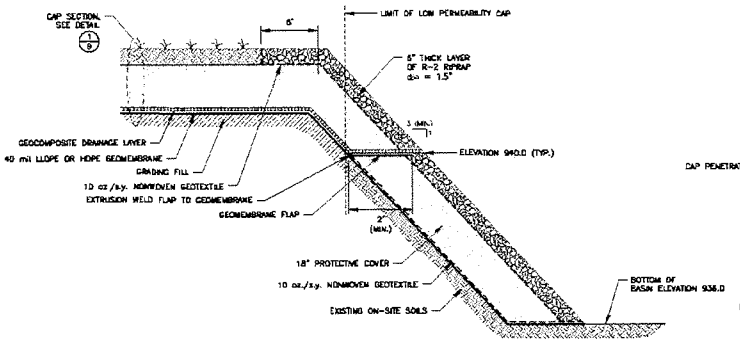
1/9 LOW PERMEABILITY CAP SECTION

NOT TO SCALE
(SEE NOTES 1 AND 4)



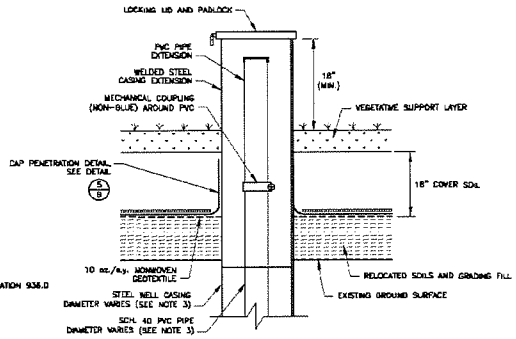
2/9 TOE DRAIN / PERIMETER ACCESS ROAD

NOT TO SCALE
(SEE NOTE 1)



3/9 CAP TERMINATION / SEDIMENT BASIN TRANSITION

NOT TO SCALE
(SEE NOTE 1)

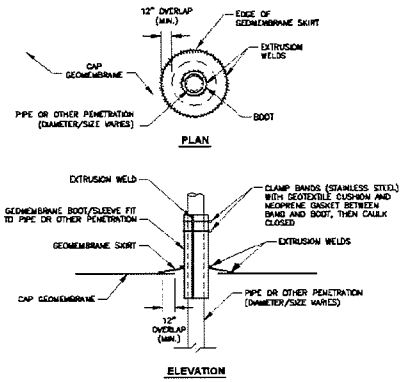


4/9 MONITORING WELL EXTENSION

NOT TO SCALE

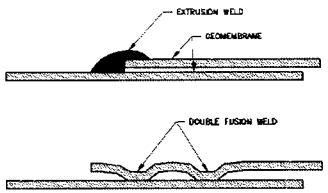
MONITORING WELL EXTENSION NOTES

1. CONTRACTOR SHALL USE A MECHANICAL COUPLING TO EXTEND PVC PIPE. NO GLUE SHALL BE USED.
2. CONTRACTOR SHALL WELD STELL CASING EXTENSION TO STICK UP A MINIMUM OF 18" ABOVE FINAL GRADE.
3.) CONTRACTOR SHALL VERIFY PVC DIAMETER AND CASING DIAMETER PRIOR TO EXTENSION OF MONITORING WELL.



5/9 CAP PENETRATION

NOT TO SCALE



6/9 GEOMEMBRANE SEAMS

NOT TO SCALE
(SEE NOTE 7)

NOTES

1.) GEOSYNTHETICS THICKNESSES ARE EXAGGERATED FOR CLARITY.

2.) REFER TO SPECIFICATIONS SECTIONS 02223, 02235, 02271 AND 02938 FOR MATERIAL GRADATION AND COMPACTION REQUIREMENTS.

3.) A 4-INCH TO 6-INCH THICK LAYER OF GRADING FILL SCREENED TO REMOVE PLUS 3/8-INCH MATERIAL SHALL BE PLACED OVER THE RELOCATED IMPACTED SOILS PRIOR TO INSTALLATION OF GEOSYNTHETICS.

4.) LIMIT OF LOW PERMEABILITY CAP IS SHOWN ON DRAWING 7.

5.) VEGETATIVE SOIL LAYER MAY BE REPLACED WITH ALTERNATIVE LAYER COMPLYING WITH PERFORMANCE STANDARDS UNDER 25 PA 288.234(c) AND APPROVED BY AGENCIES AS PROVIDED FOR UNDER THE EQUIVALENCY REVIEW PROCEDURE IN 25 PA CHAPTER 287.231.

6.) THE ACCESS ROAD IS PROPOSED ALONG THE PERIMETER OF THE CAP FOR FUTURE MAINTENANCE AND INSPECTION, BUT THE EXACT LOCATION OF THE ROAD WILL BE ADJUSTED, IN THE FIELD, TO SUIT FIELD CONDITIONS.

7.) FUSION WELDS SHALL BE PRIMARY GEOMEMBRANE SEAM TYPE. EXTRUSION WELDS SHALL BE LIMITED TO REPAIRS, PATCHES, DAPS, AND FLAPS.

REV	DATE	DES	REVISION DESCRIPTION	DESIGN	CHK	APVD
1	02/22/13	VET	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VET	JBG

PROJECT
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

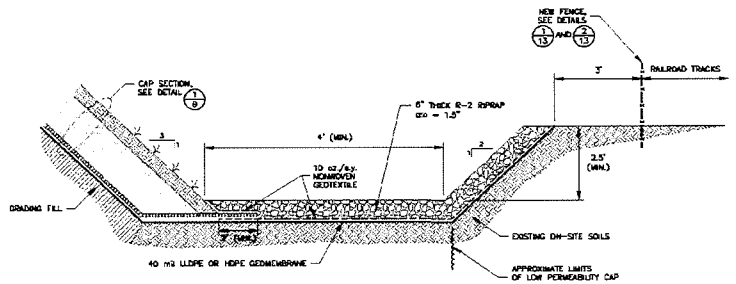
TITLE
FORMER DISPOSAL AREAS
CAP DETAILS

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065429-E

Golder Associates
Mt. Laurel, New Jersey

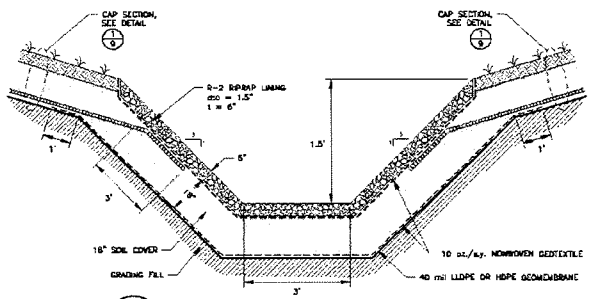
PROJECT No.	073-6009	FILE No.	073600900B
DESIGN	VET	01/08/12	SCALE AS SHOWN REV. 1
CADD	RG	01/09/12	
CHECK	VET	01/09/12	DRAWING 9
REVIEW	JBG	01/09/12	

TRINCBI 0039193



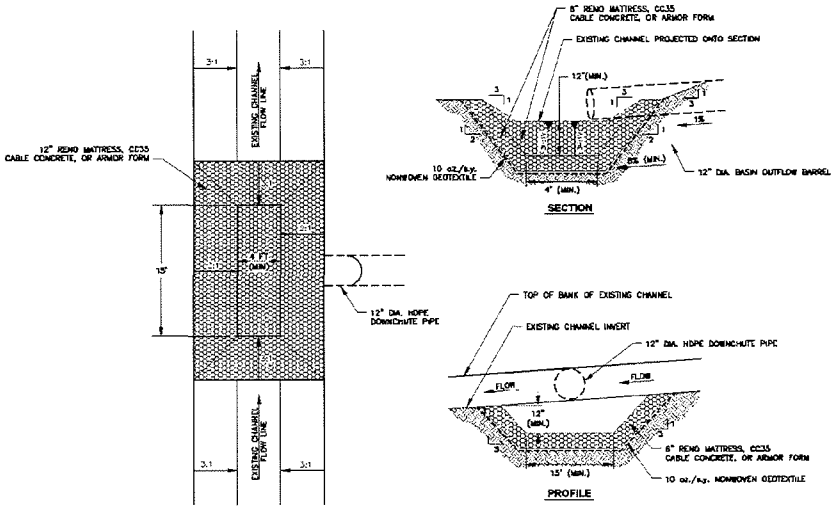
1/10 DIVERSION CHANNEL / CAP TERMINATION

NOT TO SCALE
(SEE NOTES 1 AND 2)



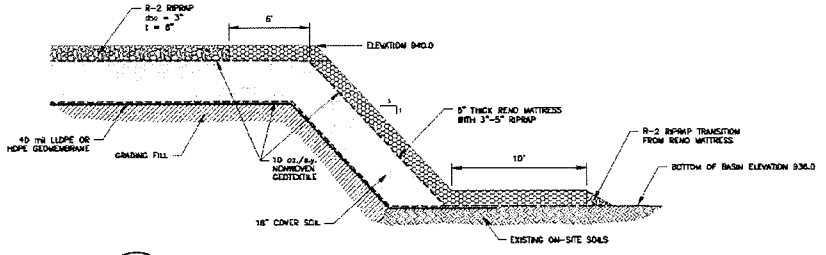
2/10 CONVEYANCE CHANNEL

NOT TO SCALE
(SEE NOTES 1 AND 3)



3/10 TYPICAL DOWNCHUTE SCOUR PAD DETAIL

NOT TO SCALE



4/10 CONVEYANCE CHANNEL INVERT - OUTLET AT BASIN

NOT TO SCALE

NOTES

1.) CHANNEL LOCATIONS ARE SHOWN ON DRAWING 7.

2.) THE AVERAGE SLOPE FOR THE DIVERSION CHANNEL IS 0.2%.

3.) THE AVERAGE SLOPE FOR THE CONVEYANCE CHANNEL IS 0.5%.

REV	DATE	DES	REVISION DESCRIPTION	CHKD	CHK	PROJ MGR
1	02/22/13	JAB	PREPARED IN RESPONSE TO APRIL 27, 2011 PADEP COMMENTS	RG	VET	JBG

PROJECT
REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

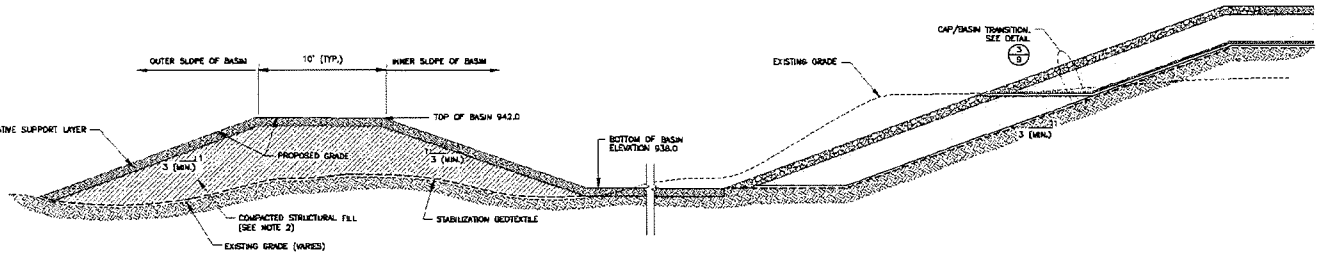
TITLE
FORMER DISPOSAL AREAS CHANNEL DETAILS

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-085429-E

Golder Associates
Mt. Laurel, New Jersey

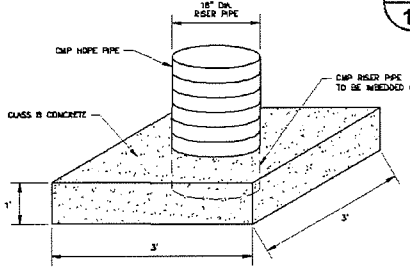
PROJECT No.	073-6009	FILE No.	073009B08
DESIGN	JAB	01/09/12	SCALE AS SHOWN REV. 1
DRDD	RG	01/09/12	
CHECK	VET	01/09/12	DRAWING 10
REVIEW	JBG	01/09/12	

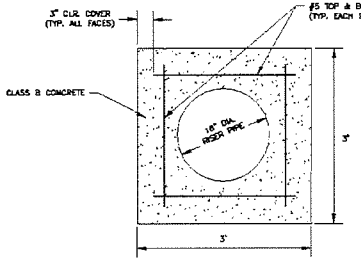
TRINCBI 0039194



1/11 TYPICAL BASIN PERIMETER BERM EMBANKMENT STABILIZATION

NOT TO SCALE

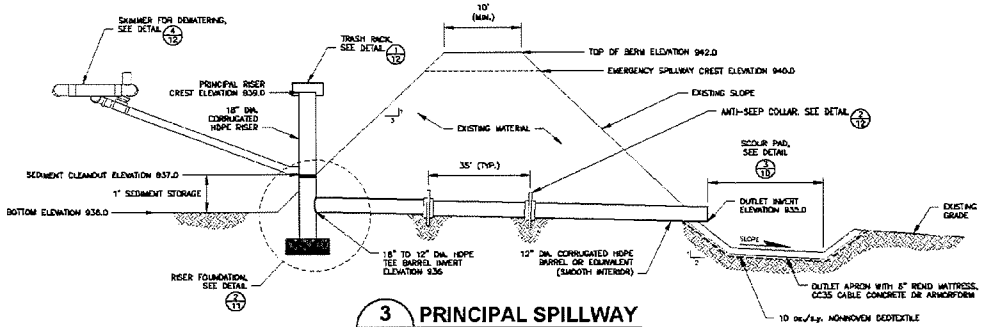




REINFORCEMENT PLAN

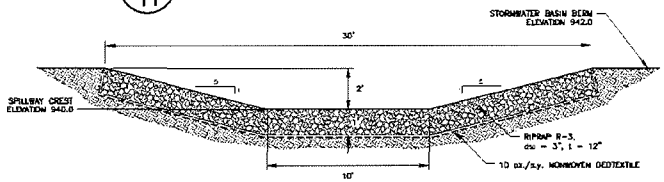
2/11 CONCRETE BASE

NOT TO SCALE



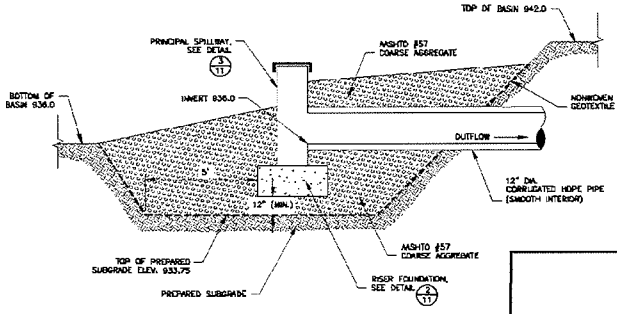
3/11 PRINCIPAL SPILLWAY

NOT TO SCALE



4/11 EMERGENCY SPILLWAY

NOT TO SCALE



5/11 PIPE PENETRATION

NOT TO SCALE

NOTES

1.) GEOSYNTHETICS EXAGGERATED FOR CLARITY.

2.) THE BASIN EMBANKMENT SHALL BE CONSTRUCTED WITH STRUCTURAL FILL MEETING THE REQUIREMENTS IN SPECIFICATION SECTION 02225.

3.) THE CONTRACTOR SHALL RAKE THE PREPARED BASIN SUBGRADE TO REMOVE PARTICLES GREATER THAN 2" IN ANY DIMENSION.

REV	DATE	DES	REVISION DESCRIPTION	DRAWN	CHK	APVD
1	02/22/13	VCF	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VCF	JBG

PROJECT: REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

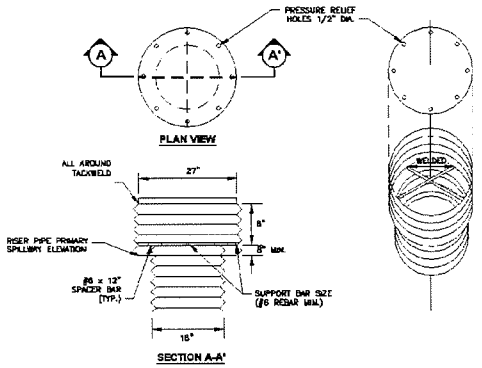
TITLE: FORMER DISPOSAL AREA
STORMWATER BASIN DETAILS
(SHEET 1 OF 2)

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-055425-E

Golder Associates
Mt. Laurel, New Jersey

PROJECT No.	073-6009	FILE No.	073600MB06
DESIGN	VCF	01/09/12	SCALE AS SHOWN REV. 1
DRDD	RG	01/09/12	
CHECK	VCF	01/09/12	DRAWING 11
REVIEW	JBG	01/09/12	

TRINCBI 0039195



TOP IS 16 GUAGE CORRUGATED METAL OR 1/8" STEEL PLATE. PRESSURE RELIEF HOLES MAY BE OMITTED, IF ENDS OF CORRUGATIONS ARE LEFT FULLY OPEN WHEN THE TOP IS ATTACHED.

ANTI-VORTEX CYLINDER IS 16 GUAGE CORRUGATED METAL PIPE OR FABRICATED FROM 1/8" STEEL PLATE.

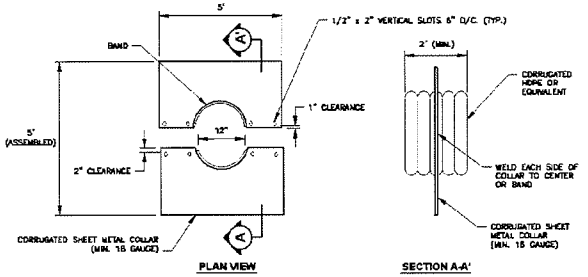
TRASH RACK AND ANTI-VORTEX DEVICE NOTES

1). THE CYLINDER MUST BE FIRMLY FASTENED TO THE TOP OF THE RISER.

2). WELD SUPPORT BARS TO THE TOP OF THE RISER OR ATTACH BY STRAPS BOLTED TO TOP OF RISER.

1/12 TRASH RACK AND ANTI-VORTEX DEVICE

NOT TO SCALE



2/12 CORRUGATED METAL ANTI-SEEP COLLAR

NOT TO SCALE

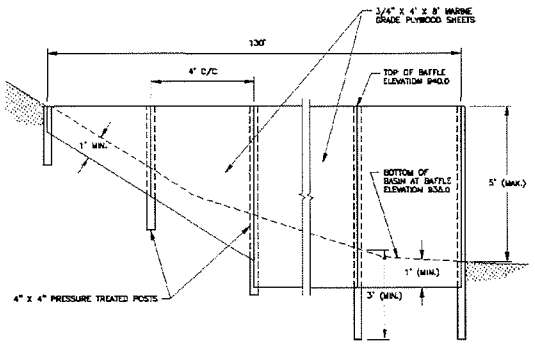
CORRUGATED METAL ANTI-SEEP COLLAR NOTES

1.) UNASSEMBLED COLLARS SHALL BE MARKED BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.

2.) THE LAP BETWEEN THE TWO HALF SECTIONS AND BETWEEN THE PIPE AND CONNECTING BAND SHALL BE CAULKED WITH ASPHALT MASTIC AT TIME OF INSTALLATION.

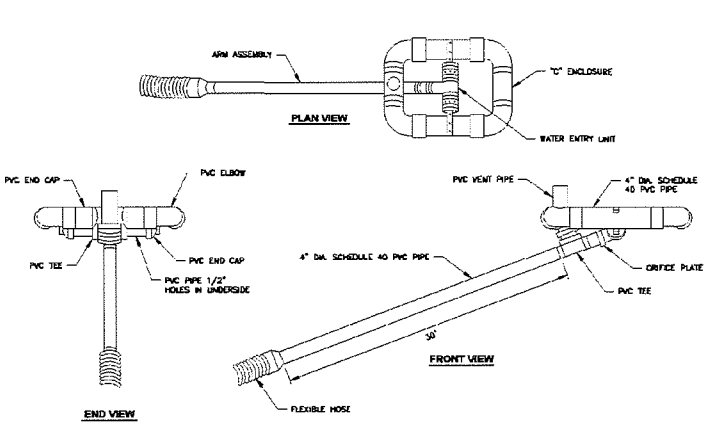
3.) EACH COLLAR SHALL BE FURNISHED WITH TWO 1/2" DIAMETER RODS WITH STANDARD TANK LUGS FOR CONNECTING COLLARS TO PIPE.

4.) EQUIVALENT PRE-FABRICATED ANTI-SEEP COLLARS MAY BE UTILIZED.



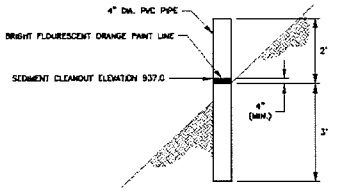
3/12 SEDIMENT BASIN BAFFLE

NOT TO SCALE



4/12 SKIMMER

NOT TO SCALE
(SHOWN AS MANUFACTURED BY FAIRCLOTH®)



5/12 SEDIMENT CLEANOUT STAKE DETAIL

NOT TO SCALE

REV	DATE	DES	REVISION DESCRIPTION	CHKD	CHK	APVD
1	02/22/13	JAB	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VCF	JBG

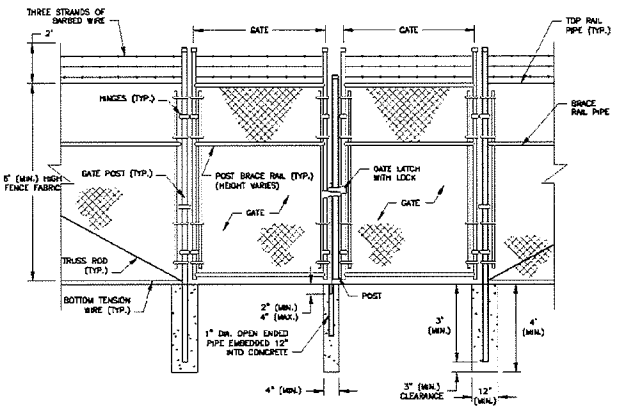
PROJECT: REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE: FORMER DISPOSAL AREAS STORMWATER BASIN DETAILS (SHEET 2 OF 2)

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065429-E

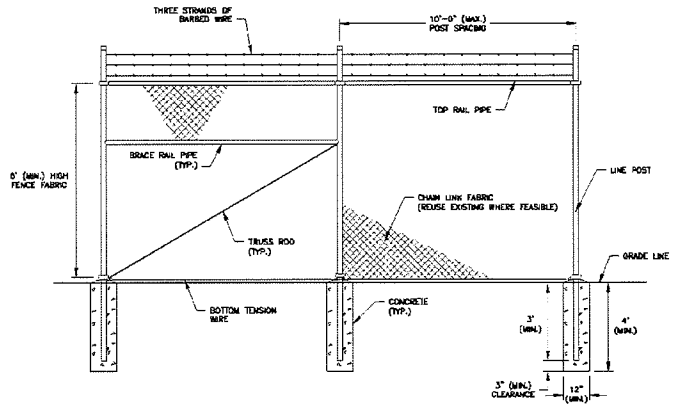
Golder Associates
Mt Laurel, New Jersey

PROJECT No.	073-6009	FILE No.	0736009A007
DESIGN	JAB	01/09/12	SCALE AS SHOWN REV. 1
DRAWN	RG	01/09/12	
CHECK	VCF	01/09/12	DRAWING 12
REVIEW	JBG	01/09/12	



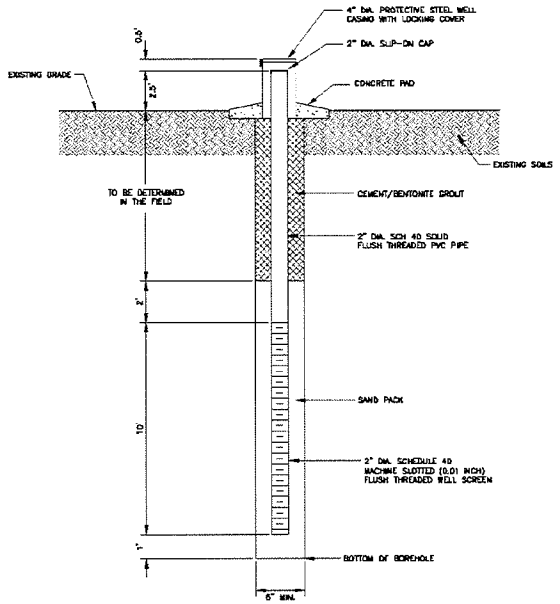
1/13 **CHAIN LINK FENCE GATE**

NOT TO SCALE



2/13 **CHAIN LINK FENCE**

NOT TO SCALE



3/13 **GROUNDWATER MONITORING WELL MW-S1**

NOT TO SCALE

NOTE

1.) THE LENGTH OF PVC RISER VARIES. THE LENGTH OF RISER PROVIDED SHALL ACCOMMODATE THE REQUIRED CLEARANCES AS SHOWN.

REV	DATE	DES	REVISION DESCRIPTION	QCD	CHK	APVL
1	02/22/13	JAB	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VEF	JDG

PROJECT

REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE

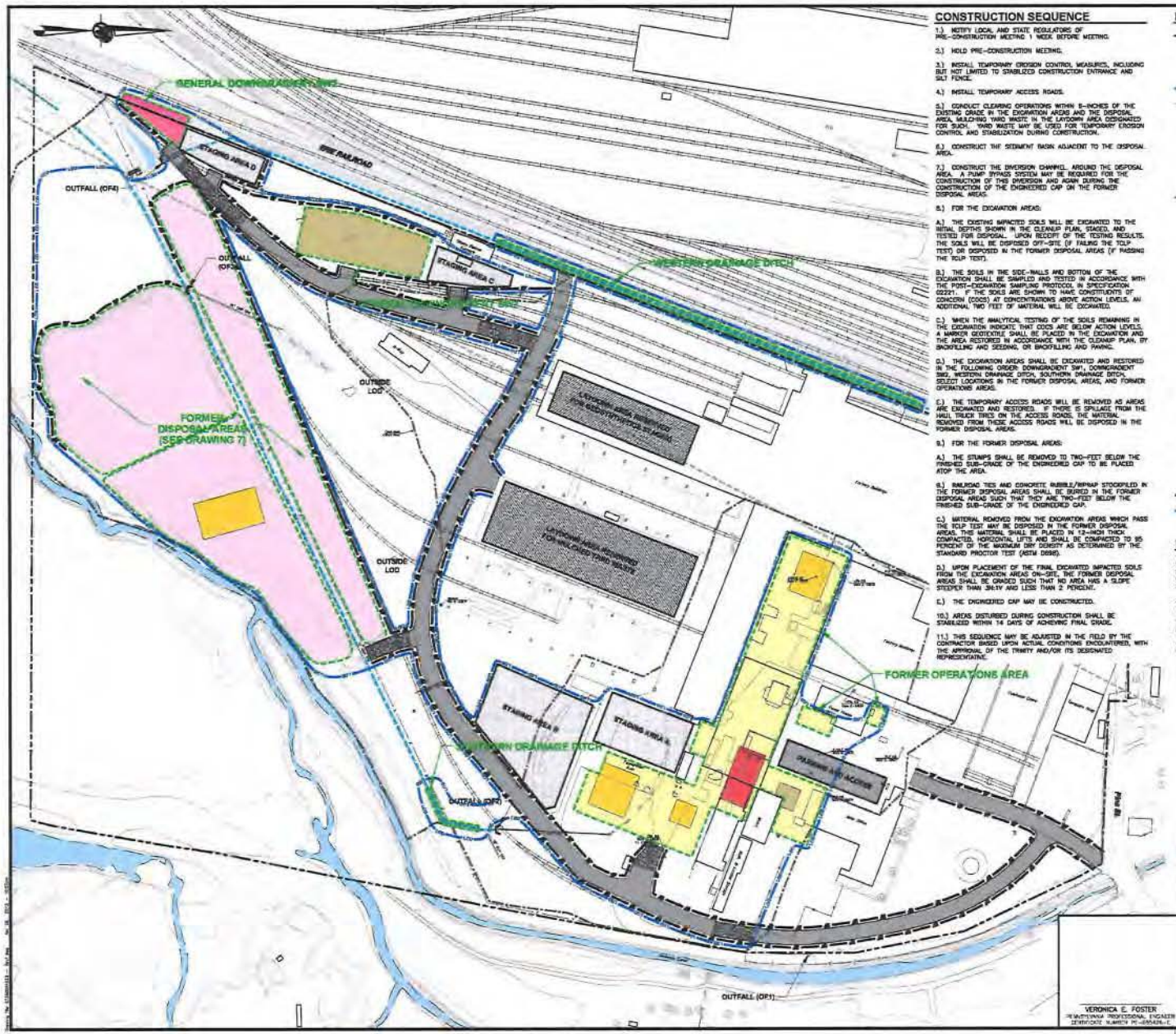
MISCELLANEOUS DETAILS

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065423-E

Golder Associates
Mt Laurel, New Jersey

PROJECT No.	073-8009	FILE No.	0736009AB18
DESIGN	JAB	01/09/12	SCALE AS SHOWN REV. 1
DRDD	RG	01/09/12	
CHECK	VEF	01/09/12	DRAWING 13
REVIEW	JBG	01/09/12	

TRINCBI 0039197



CONSTRUCTION SEQUENCE

1.) NOTIFY LOCAL AND STATE REGULATORS OF PRE-CONSTRUCTION MEETING 1 WEEK BEFORE MEETING.

2.) HOLD PRE-CONSTRUCTION MEETING.

3.) INSTALL TEMPORARY EROSION CONTROL MEASURES, INCLUDING BUT NOT LIMITED TO STABILIZED CONSTRUCTION ENTRANCE AND SILT FENCE.

4.) INSTALL TEMPORARY ACCESS ROADS.

5.) CONDUCT CLEARING OPERATIONS WITHIN 6-INCHES OF THE EXISTING GRADE IN THE EXCAVATION AREAS AND THE DISPOSAL AREA. BUILDING YARD WASTE IN THE LAYDOWN AREA DESIGNATED FOR SUCH. YARD WASTE MAY BE USED FOR TEMPORARY EROSION CONTROL AND STABILIZATION DURING CONSTRUCTION.

6.) CONSTRUCT THE SEDIMENT BASIN ADJACENT TO THE DISPOSAL AREA.

7.) CONSTRUCT THE DIVERSION CHANNEL AROUND THE DISPOSAL AREA. A PUMP BYPASS SYSTEM MAY BE REQUIRED FOR THE CONSTRUCTION OF THIS DIVERSION AND AGAIN DURING THE CONSTRUCTION OF THE ENGINEERED CAP ON THE FORMER DISPOSAL AREAS.

8.) FOR THE EXCAVATION AREAS:

A.) THE EXISTING IMPACTED SOILS WILL BE EXCAVATED TO THE INITIAL DEPTHS SHOWN IN THE CLEANUP PLAN, STAGED, AND TESTED FOR DISPOSAL. UPON RECEIPT OF THE TESTING RESULTS, THE SOILS WILL BE DISPOSED OFF-SITE (IF FAILING THE TCLP TEST) OR DISPOSED IN THE FORMER DISPOSAL AREAS (IF PASSING THE TCLP TEST).

B.) THE SOILS IN THE SIDE-WALLS AND BOTTOM OF THE EXCAVATION SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH THE POST-EXCAVATION SAMPLING PROTOCOL IN SPECIFICATION 02221. IF THE SOILS ARE SHOWN TO HAVE CONSTITUENTS OF CONCERN (COCS) AT CONCENTRATIONS ABOVE ACTION LEVELS, AN ADDITIONAL TWO FEET OF MATERIAL WILL BE EXCAVATED.

C.) WHEN THE ANALYTICAL TESTING OF THE SOILS REMAINING IN THE EXCAVATION INDICATE THAT COCS ARE BELOW ACTION LEVELS, A MARKER GEOTEXTILE SHALL BE PLACED IN THE EXCAVATION AND THE AREA RESTORED IN ACCORDANCE WITH THE CLEANUP PLAN, BY BACKFILLING AND SEEDING, OR BACKFILLING AND PAVING.

D.) THE EXCAVATION AREAS SHALL BE EXCAVATED AND RESTORED IN THE FOLLOWING ORDER: DOWNGRADIENT SW1, DOWNGRADIENT SW2, WESTERN DRAINAGE DITCH, SOUTHERN DRAINAGE DITCH, SELECT LOCATIONS IN THE FORMER DISPOSAL AREAS, AND FORMER OPERATIONS AREAS.

E.) THE TEMPORARY ACCESS ROADS WILL BE REMOVED AS AREAS ARE EXCAVATED AND RESTORED. IF THERE IS SPILLAGE FROM THE HAUL TRUCK TIRES ON THE ACCESS ROADS, THE MATERIAL REMOVED FROM THESE ACCESS ROADS WILL BE DISPOSED IN THE FORMER DISPOSAL AREAS.

9.) FOR THE FORMER DISPOSAL AREAS:

A.) THE STUMPS SHALL BE REMOVED TO TWO-FEET BELOW THE FINISHED SUB-GRADE OF THE ENGINEERED CAP TO BE PLACED ATOP THE AREA.

B.) RAILROAD TIES AND CONCRETE RUBBLE/RIPRAP STOCKPILED IN THE FORMER DISPOSAL AREAS SHALL BE BURIED IN THE FORMER DISPOSAL AREAS SUCH THAT THEY ARE TWO-FEET BELOW THE FINISHED SUB-GRADE OF THE ENGINEERED CAP.

C.) MATERIAL REMOVED FROM THE EXCAVATION AREAS WHICH PASS THE TCLP TEST MAY BE DISPOSED IN THE FORMER DISPOSAL AREAS. THIS MATERIAL SHALL BE PLACED IN 12-INCH THICK COMPACTED, HORIZONTAL LIFTS AND SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST (ASTM D698).

D.) UPON PLACEMENT OF THE FINAL EXCAVATED IMPACTED SOILS FROM THE EXCAVATION AREAS ON-SITE, THE FORMER DISPOSAL AREAS SHALL BE GRADED SUCH THAT NO AREA HAS A SLOPE STEEPER THAN 3H:1V AND LESS THAN 2 PERCENT.

E.) THE ENGINEERED CAP MAY BE CONSTRUCTED.

10.) AREAS DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED WITHIN 14 DAYS OF ACHIEVING FINAL GRADE.

11.) THIS SEQUENCE MAY BE ADJUSTED IN THE FIELD BY THE CONTRACTOR BASED UPON ACTUAL CONDITIONS ENCOUNTERED, WITH THE APPROVAL OF THE TRINITY AND/OR ITS DESIGNATED REPRESENTATIVE.

LEGEND

- PROPERTY LINE
- RAILS
- CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- STREAM OR CREEK
- EXTENT OF AREAS TO BE ADDRESSED BY EXCAVATION OF IMPACTED SOILS AND BACKFILLING (SEE NOTE 1)
- EXTENT OF DISPOSAL AREA TO BE CAPPED (SEE NOTE 2)
- SURVEY BOUNDARY (SEE REFERENCE 1)
- STAGING AREA
- PARKING AND ACCESS
- LAYDOWN AREA
- 2 FT EXCAVATION
- 0-2 FT SURFACE SOIL REMOVAL
- 4 FT EXCAVATION
- 6 FT EXCAVATION
- 8 FT EXCAVATION
- 6 FT EXCAVATION AND IN-SITU SOIL STABILIZATION FROM 8-20 FT
- PROPOSED ACCESS ROAD
- STABILIZED CONSTRUCTION ENTRANCE
- SF SF — SILT FENCE OR HAYBALE
- LOD LOD — LIMIT OF DISTURBANCE

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 09-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC." PROVIDED BY HOWELLS & BARD, INC. DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BARD, INC. DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-86 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "09-3820 GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BARD, INC. DATED AUGUST 25, 2011.

SCALE: 80 0 80 160 FEET

NO	DATE	BY	REVISION DESCRIPTION	DESIGN	CHK	APP
1	02/23/12	VEF	PROVIDED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RG	VEF	JBG

PROJECT: REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

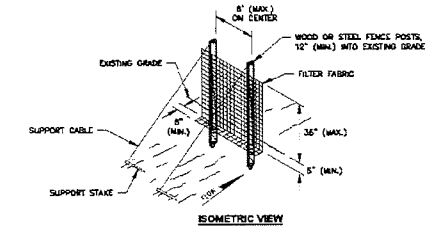
TITLE: **TEMPORARY EROSION AND SEDIMENT CONTROL PLAN**

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-085626-E

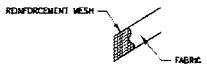
Golder Associates
Philadelphia USA

PROJECT No.	073-8008	FILE No.	073800RA020
DESIGN	VEF	01/09/12	SCALE: AS SHOWN REV. 1
CADD	RG	01/09/12	
CHECK	VEF	01/09/12	DRAWING 14
REVIEW	JBG	01/09/12	

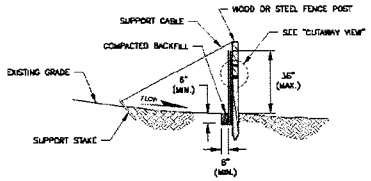
TRINCBI 0039198



ISOMETRIC VIEW



CUTAWAY VIEW



SECTION VIEW

1/15 SILT FENCE

NOT TO SCALE

SILT FENCE CONSTRUCTION NOTES

1.) SILT FENCE SHALL BE INSTALLED AS SHOWN AND AS NEEDED TO PROVIDE TEMPORARY EROSION PROTECTION.

2.) SILT FENCE SHALL BE USED TO PROTECT BERM OUTSLOPES DURING STABILIZATION AND OTHER PROJECT AREAS NOT OTHERWISE DRAINING TO A SEDIMENT CONTROL FACILITY.

3.) SILT FENCE SHALL NOT BE USED IN AREAS OF CONCENTRATED FLOW. ALL EFFORT SHALL BE MADE TO EVENLY AND UNIFORMLY GRADE UP-SLOPE AREAS TO PROMOTE OVERLAND SHEET FLOW TO THE FENCE LINE.

4.) FILTER FABRIC SHALL BE FASTENED SECURELY TO FENCE POST WITH METAL STAPLES, OR TIE-WIRE.

5.) SILT FENCE SECTION SHALL BE INSTALLED ON LEVEL GRADE, WITH BOTH FENCE ENDS TURNED UPSLOPE SUCH THAT BOTTOM OF FENCE IS EQUAL IN ELEVATION TO TOP OF LEVEL PORTION.

6.) FENCE POSTS SHALL BE STAKED 8' CENTER TO CENTER.

7.) REMOVE SEDIMENT DEPOSITS WHEN SEDIMENT ACCUMULATES TO 1/2 THE ABOVE-GROUND HEIGHT OF FENCE.

8.) ANY SILT FENCE WHICH HAS EITHER BEEN UNDERMINED OR OVERTOPPED MUST BE IMMEDIATELY REPLACED WITH ROCK-FILTER OUTLETS.

9.) AT FABRIC ENDS, BOTH ENDS SHALL BE WRAPPED AROUND THE WOODEN OR STEEL FENCE POST AND STAPLED.

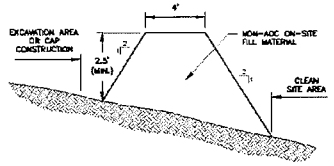
MATERIAL REQUIREMENTS FOR SILT FENCE

FENCE POSTS:	STEEL EITHER TYPE T OR U, OR 2" x 2" WOOD
FABRIC:	MIRAFI 100X OR APPROVED EQUIVALENT
SUPPORT STAKE:	1" x 1" x 12"
SUPPORT CABLE:	10 GAUGE WIRE MIN.
REINF. MESH:	EITHER INDUSTRIAL POLYPROPOLENE OR STEEL MESH w/ MAX 6" OPENING - 1" - MIN 14 GAUGE

MAXIMUM SLOPE LENGTHS FOR FABRIC FENCES

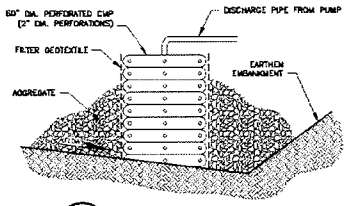
SLOPE-PERCENT	MAXIMUM SLOPE LENGTH (ft) ABOVE FENCES 36" HIGH FENCE
2 (OR LESS)	500
5	250
10	150
15	100
20	70
25	55
30	45
35	40
40	35
45	30
50	25

* ADAPTED FROM INFORMATION PROVIDED IN PaDEP BMOP "EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL," MARCH 2000



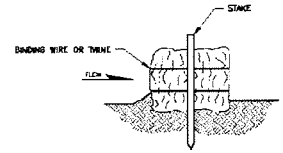
5/15 DIVERSION BERM

NOT TO SCALE

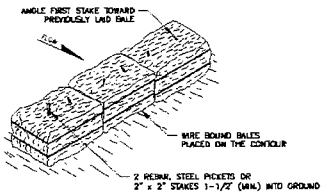


2/15 TEMPORARY SUMP

NOT TO SCALE



SECTION VIEW



ISOMETRIC VIEW

3/15 STAKED BALE

NOT TO SCALE

STAKED BALE CONSTRUCTION NOTES

1.) STAKED BALE SHALL BE INSTALLED AS SHOWN AND AS NEEDED TO PROVIDE TEMPORARY EROSION PROTECTION.

2.) BALES SHALL BE USED TO PROTECT BERM OUTSLOPES DURING STABILIZATION AND OTHER PROJECT AREAS NOT OTHERWISE DRAINING TO A SEDIMENT CONTROL FACILITY.

3.) BALES SHALL NOT BE USED IN AREAS OF CONCENTRATED FLOW. ALL EFFORT SHALL BE MADE TO EVENLY AND UNIFORMLY GRADE UPSLOPE AREAS TO PROMOTE OVERLAND SHEET FLOW TO THE BALE LINE.

4.) BALES SHALL BE INSTALLED ON LEVEL GRADE, WITH END BALES TURNED UPSLOPE SUCH THAT BOTTOM OF BALES IS EQUAL IN ELEVATION TO TOP OF LEVEL PORTION.

5.) REPLACE BALES EVERY THREE (3) MONTHS, OR SOONER IF DETERIORATION PREVENTS PROPER OPERATION.

6.) REMOVE SEDIMENT DEPOSITS WHEN SEDIMENT ACCUMULATES TO 1/2 THE ABOVE- GROUND HEIGHT OF THE BALE DIKE.

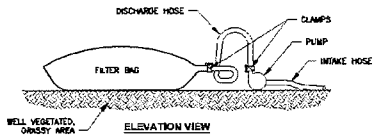
7.) ANY BALES WHICH HAVE EITHER BEEN UNDERMINED OR OVERTOPPED MUST BE IMMEDIATELY REPLACED WITH ROCK-FILTER OUTLETS.

8.) DIRT BAGS MAY BE USED IN PLACE OF HAYBALES.

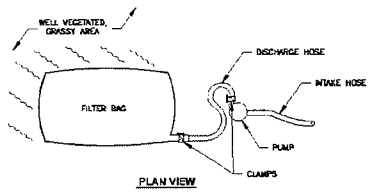
MAXIMUM SLOPE LENGTHS FOR BALE BARRIERS

SLOPE-PERCENT	MAXIMUM SLOPE LENGTH (ft) ABOVE BARRIER
2 (OR LESS)	250
5	100
10	50
15	35
20	20
25	20
30	15
35	15
40	10
45	10
50	10

* ADAPTED FROM INFORMATION PROVIDED IN PaDEP BMOP "EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL", MARCH 2000.



ELEVATION VIEW



PLAN VIEW

4/15 SEDIMENT FILTER BAG

NOT TO SCALE

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	APVR
1	02/22/13	VCF	PREPARED IN RESPONSE TO APRIL 27, 2012 PaDEP COMMENTS	RG	VCF	JBG

PROJECT: REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

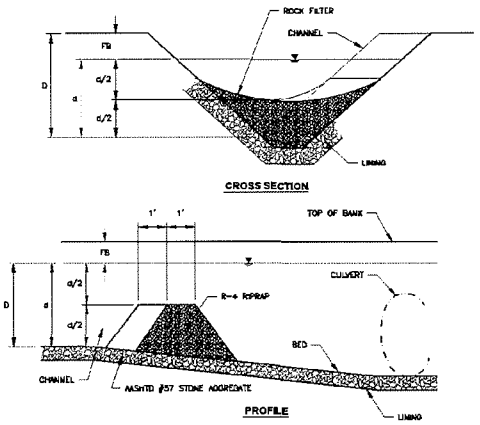
TITLE: TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS (SHEET 1 OF 2)

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065479-E

Golder Associates
Mt. Laurel, New Jersey

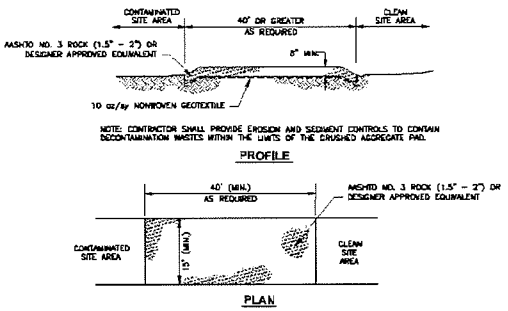
PROJECT No.	073-6009	FILE No.	0736009B10
DESIGN	VCF	01/09/12	SCALE AS SHOWN REV. 1
CADD	RG	01/09/12	
CHECK	VCF	01/09/12	DRAWING 15
REVIEW	JBG	01/09/12	

TRINCBI 0039199



1/16 ROCK FILTER (TYP.)

NOT TO SCALE



2/16 TRACKING PAD / STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

REV	DATE	BY	REVISION DESCRIPTION	CADD	CHK	PM/M
1	02/22/13	VEF	PREPARED IN RESPONSE TO APRIL 27, 2012 PADEP COMMENTS	RC	VEF	JBG

PROJECT

REVISED CLEANUP PLAN - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS (SHEET 2 OF 2)

VERONICA E. FOSTER
PENNSYLVANIA PROFESSIONAL ENGINEER
CERTIFICATE NUMBER PE-065473-E

Golder Associates
Mt Laurel, New Jersey

PROJECT No.	073-6009	FILE No.	073600BA011		
DESIGN	VEF	01/08/12	SCALE	AS SHOWN	REV. 1
CADD	RG	01/09/12			
CHECK	VEF	01/09/12	DRAWING 16		
REVIEW	JBG	01/09/12			

TRINCBI 0039200

REVISED CLEANUP PLAN
SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

VOLUME 2 OF 4

Submitted To: Pennsylvania Department of Environmental Protection
Environmental Cleanup Program
230 Chestnut Street
Meadville, PA 16335-3481

Submitted By: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

Distribution:

2 Copies	Pennsylvania Department of Environmental Protection
1 Copy	United States Environmental Protection Agency
1 Copy	Trinity Industries, Inc.

February 2013

Project No.: 073-6009-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

Volume 1 of 4

List of Tables

List of Figures

List of Design Drawings

Volume 2 of 4

List of Appendices

APPENDIX A

CORRESPONDENCE WITH PADEP REGARDING CLEANUP PLAN

APPENDIX A-1

JUNE 7, 2011 PADEP LETTER

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHWEST REGIONAL OFFICE

June 7, 2011

Terry Barrett, P.G.
Remediation Projects Manager
Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Re: Cleanup Work Plan - South Plant Site
(Approval with Modifications)
March 28, 2011
Trinity Industries, Inc.
Facility ID No. 690370
City of Greenville, Mercer County

Dear Mr. Barrett:

The Pennsylvania Department of Environmental Protection (Department) has reviewed the above-referenced Cleanup Work Plan received on March 28, 2011. The Plan was prepared by Golder Associates, Inc. and submitted on behalf of Trinity Industries, Inc. in accordance with Paragraph 3.g. of the December 21, 2006, Consent Order and Agreement between Trinity Industries, Inc. and the Department.

The Cleanup Work Plan is not a document required to be submitted or approved under the Land Recycling and Environmental Remediation Standards Act, Act of May 19, 1995, P.L. 4, 35 P.S. §§6026.101-6026.908 (Act 2) or its regulations. The Department understands that the Cleanup Work Plan proposes a conceptual approach to Trinity's proposed cleanup of the South Plant Site. Trinity's formal submission of a "Cleanup Plan," as that term is used in Act 2 and its regulations will follow the Department's approval of this Cleanup Work Plan. The Department reserves its right to approve or disapprove the formal Cleanup Plan in accordance with Act 2.

In accordance with Paragraph17 of the Consent Order and Agreement, the Department hereby approves the Cleanup Work Plan with the following modifications and provides comments for Trinity's consideration in preparing the Cleanup Plan required by Act 2:

Soils:

Trinity selected the Act 2 Non-Use Aquifer Standard for groundwater and soil media at this site. Selection of this standard requires a Department-approved Non-Use Aquifer Determination in accordance with 25 Pa. Code §250.303. Trinity has not requested approval of a Non-use Aquifer Determination. It is unlikely that a Non-use Aquifer Determination could be approved due to

known off-property groundwater use in hydrogeologically downgradient locations. It should also be noted that the Non-Use Aquifer Statewide Health Standard could not be used to address the historical fill at the site.

Contaminants of Concern:

All contaminants found to exceed the Act 2 Statewide Health Standard or a Practical Quantitation Limit (PQL) during the remedial investigation should be addressed in the Cleanup Plan, Risk Assessment (if necessary), and the Final Report.

Groundwater:

As stated above, Trinity has not requested approval of a Non-Use Aquifer Determination. Accordingly, the use of a non-use aquifer standard for the site is not appropriate. If Trinity intends on utilizing the non-use aquifer standard, they will need to demonstrate that they meet the non-use requirements under Section 250.303 of the Department's regulations. The Cleanup Work Plan identifies downgradient potable wells that are finished in bedrock and implies that the bedrock and overburden aquifers are not hydraulically connected. However, the Remedial Investigation Report contains no data that provides a justification for making this determination.

Historic Fill/Waste:

The Cleanup Work Plan proposes that the historic fill in the disposal areas (AOC-1, AOC-11, and AOC-17) will be further evaluated utilizing TCLP samples for hazardous waste determination. Trinity also plans on TCLP sampling the areas with lead levels in surface soil above 1,000 mg/kg, including the Disposal Areas, Former Operating Areas, and the Western Drainage Ditch and two down-gradient areas, to determine if the material in these areas is hazardous. If any of the waste material is determined to be hazardous, the material must be either excavated and removed for off-site disposal or capped in place on-site by following 40 CFR 265.310 or 40 CFR 264.310, depending on whether disposal occurred after September 26, 1982. Trinity should develop a sampling plan based on what level of lead in the sand material is determined to be hazardous.

The Remedial Investigation Report concludes that almost the entire site exists on residual fill/"tan sand" as indicated on Figure 4-1, *Site Geologic Cross Sections,* from the Remedial Investigation Report - South Plant. This residual fill/tan sand appears to have been placed before 1988 and would therefore meet the definition of "historic fill" contained in the Department's Management of Fill Policy, dated April 24, 2004. If the concentrations of regulated substances in this historic fill exceed the values in Tables FP-1a and b of the *Management of Fill* Policy, then this historic fill is considered "regulated fill" and a waste under the Department's *Management of Fill* Policy and the Solid Waste Management Act.

As indicated above, any of this historic fill meeting the definition of a "hazardous waste" would require either removal for proper off-site disposal, or capping in place in accordance with applicable state and federal laws and regulations.

The historic fill containing lead levels above 450 mg/kg would be considered a waste and would require management as a residual waste or hazardous waste by either removal off-site for appropriate disposal or consolidation on-site under an appropriate cap. Act 2 relief from liability may be obtained for areas where confirmation sampling verifies all material in excess of 450 mg/kg was removed for disposal or consolidated for capping in place.

The waste disposed in the Old Ball Field Area was disposed after 1980 and requires removal for proper disposal or capping in place under the Department's residual waste regulations or, if the waste is determined to be hazardous, appropriate State and Federal regulations. A synthetic cap and two feet of soil capable of supporting vegetation will be required for capping any residual waste.

The waste may be consolidated from the Former Operating Areas at the site into the 3 disposal areas (AOC-1, AOC-11, and AOC-17) and then capped in place with the synthetic cover and 2 feet of vegetated soil as planned. Any hazardous waste would require either removal for proper off-site disposal or capping in place, adhering to applicable state and federal laws and regulations.

It should be noted that some of the waste in the Disposal Areas and Former Operating Areas is in contact with or below the water table. The Cleanup Plan should include appropriate measures to remedy this condition.

Miscellaneous:

The vapor intrusion and sediment data collection and evaluation should be completed prior to the submission of the Cleanup Plan. Any remedies based on the collected data evaluations should be included in the Cleanup Plan.

The drawings and any engineered designs in the Cleanup Plan will need to be certified by a Registered Professional Engineer licensed in Pennsylvania. The groundwater aspects of the Cleanup Plan need to be certified by a Registered Professional Geologist licensed in Pennsylvania.

Therefore, the Department has decided to approve the Cleanup Work Plan with the modification that a Cleanup Plan be submitted in accordance with Act 2 that, in addition to meeting the procedural and substantive requirements of Act 2 and its regulations, addresses the issues identified above.

If you have any questions or need further information regarding this matter, please contact Ms. Kristie Shimko at 814.678.6189.

Sincerely,

Eric A. Gustafson
Regional Manager
Environmental Cleanup

cc: John O'Hara, P.G.
Kristie Shimko
Clem DeLattre
Doug Moorehead
Grant Dufficy (USEPA)
Joseph Gormley, Jr., P.E.
Kim Bontrager
File

EAG:KS:ll

APPENDIX A-2

APRIL 27, 2012 PADEP LETTER

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHWEST REGIONAL OFFICE

April 27, 2012

CERTIFIED MAIL NO.7011 1570 0000 9053 1480

Mr. Terry Barrett
Remediation Projects Manager
Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Re: Cleanup Plan-South Plant Site
Disapproval
Trinity Industries, Inc.
Facility ID No. 731732
Borough of Greenville, Mercer County

Dear Mr. Barrett:

The Department of Environmental Protection (Department) has received and reviewed the January 30, 2012, document titled, "Cleanup Plan-South Plant Site" for the property located at 100 York Street, Greenville. The Cleanup Plan was prepared by Golder Associates, Inc. and submitted to the Department in accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2) and constitutes a Cleanup Plan as defined in Chapter 3, Section 304 of the Act.

The Department notes the following deficiencies in the Cleanup Plan and disapproves it in accordance with the provisions of Act 2:

1. As indicated in previous submissions to the Department, most of this site contains fill consisting of waste process sand. In several sections of the Cleanup Plan it is stated that the Act 2 Statewide Health Standard (SHS) would be applied to this waste process sand. The SHS is available for soil and groundwater media only. If the waste process sand is non-hazardous and its placement occurred prior to September 7, 1980, closure of the site-wide waste process sand areas can be addressed through demonstrating an Act 2 Site-Specific Standard in accordance with 250 Subchapter D. This may be done through capping and/or excavation to achieve pathway elimination utilizing the Act 2 SHS Medium Specific Concentrations (MSCs) to determine the limits of capping and/or excavation. Under this scenario, Act 2 relief from liability would be limited to the area capped or excavated. Alternatively, Trinity may elect to address the site-wide waste process sand by demonstrating that it meets a risk-based numeric Act 2 Site-Specific Standard (SSS). This alternative would require a residual risk assessment following any remediation (e.g., capping, excavation).

2. Table 2-1 titled, "Summary of COC Exceedences by AOC," indicates that manganese is a naturally occurring contaminant at AOC-13 for 'surface soils'. However, on May 13, 2011, Trinity acknowledged that the entire site is situated on historical fill. Therefore, a conclusion that manganese in fill is naturally occurring is inappropriate and should be revised in the future submittal.

3. In accordance with 25 Pa. Code §250.410(b), the remediator should submit the details of the proposed in-situ (soil) stabilization discussed in both the main report summary and Appendix C, Section 02221, Subsection 3.04(A)(3). Additionally, the remediator should provide the details of the plans for the excavated material associated with the sedimentation basin (i.e. sampling, storage, and disposal).

4. Outfalls OF-5 and OF-6 are included in the sampling plan, but are not depicted on any of the drawings. These should be included in accordance with 25 Pa. Code §250.410 in the revised report.

5. Because the Cleanup Plan proposes to leave waste in place below the water table, in order for the Department to approve this approach, Trinity must perform surface water sampling to ensure that the waste material is not currently impacting Mathay Run and the Old Erie Canal above Chapter 16 and Chapter 93 surface water criteria. Samples taken from Mathay Run and the Old Erie Canal should be collected during both low flow periods and after storm events to evaluate the impact of diffuse flow of groundwater to the streams during these conditions. Sampling points should be appropriately stationed where the impacts of groundwater to surface water would be most apparent (i.e. disposal areas adjacent to the stream). The results from the sampling should be included in the revised Cleanup Plan

6. According to the Department's January 13, 2010, disapproval letter concerning the Remedial Investigation Report (South Plant), Trinity was to provide a full and complete ecological assessment based on the appropriate attainment standard selected and include this evaluation in the Cleanup Plan in accordance with 25 Pa. Code §250.311. However, the Cleanup Plan does not include an ecological assessment. Because the Department has already determined that there is at least one candidate species on the site and Trinity is seeking attainment of the Site-Specific Standard, Trinity must have a qualified individual perform a Site-Specific Ecological Risk Assessment of the site. The report, data, and findings should be included in the revised Cleanup Plan in accordance with 25 Pa. Code §250.402.

7. The 2011 "Clean Up Work Plan-South Site" concluded that sediments impacted above the United States Environmental Protection Agency, Region 3, Biological Technical Assistance Group, Freshwater Sediment Screening Benchmarks, may be site related

(detections of contaminants found in sediments correlate to AOC-S3 for lead, manganese, and zinc). Trinity now concludes in the Cleanup Plan that the impacts to sediments are not 'site-related' and are likely related to off-site impacts. However, Trinity had a National Pollutant Discharge Elimination System (NPDES) permit (No. PAR808323) for discharge to Erie Extension Canal for Outfalls No. 1, No. 2, and No. 3. It is noted on the NPDES application that these outfalls drained approximately 55 acres of the facility to the Erie Extension Canal. Additionally, Trinity Industries-North Plant Site's stormwater discharges into the Old Erie Canal, as noted by Trinity in their "Response to Comments & Revised RI Report-North Plant" letter dated September 2, 2011. Therefore, Trinity will need to address the sediment impacts in accordance with 25 Pa. Code §§250.311 and 250.402, as well as the guidance provided in Section IV.H of the Land Recycling Technical Guidance Manual.

8. Trinity proposes to use a Site-Specific Standard of 3,600 ug/L for Manganese for groundwater migrating off-site. This proposal is contrary to Trinity's conclusion that Mathay Run and the Old Erie Canal act as a hydraulic barrier for contaminants migrating off the South Plant. Moreover, the proposal is specifically prohibited by Paragraph (6)(b) of the 2006 Consent Order and Agreement (COA) which limits Trinity to demonstrating either the Background or the Residential Used Aquifer, Statewide Health Standard at the property line and beyond.

9. Monitoring well MW-13 and MW-14 have only one water level measurement which was performed in September 2011. In addition, these monitoring wells had no sampling analysis conducted for Site Contaminants of Concern (COCs). Because these wells were installed after the submittal and subsequent approval of the Remedial Investigation Report, please refer to 25 Pa. Code §250.408(e) for the appropriate number of sampling events as these wells are being utilized for additional site characterization.

10. This report was sealed by a Professional Engineer but not a Professional Geologist. The Cleanup Work Plan Approval with Modifications letter (June 7, 2011) included language that directed Trinity to certify the Engineering plans/details in the Cleanup Plan by a Professional Engineer and any groundwater aspects to be certified by a Professional Geologist. Therefore, the revised Cleanup Plan should be certified by, both, a Professional Geologist and a Professional Engineer.

<u>General Comments Not Related to the Above-Mentioned Deficiencies:</u>

Trinity concludes that Mathay Run/Old Erie Canal is a hydraulic barrier which intercepts all groundwater contamination leaving the site; thus, preventing groundwater contamination off-site. However, data should be provided in the report to support this conclusion. At a minimum, Trinity should evaluate this conclusion by providing the following: 1) Two quarterly groundwater samples and elevations from MW-13 and MW-14 for site COCs; 2) Concurrent

samples and elevations obtained from monitoring wells adjacent to MW-12 and MW-13; 3) Concurrent stream gauge measurements should be obtained; and 4) Concurrent stream samples (for site related COCs) should be collected.

Please submit a revised document addressing the Department's concerns stated in this letter within 90 days. Please keep in mind that Paragraph 19 of the CO&A provides for stipulated penalties in the event the Department must disapprove the second revised Cleanup Plan because the concerns stated in this letter are not addressed. If you have any questions please contact Kristie Shimko at 814.332.6189.

Sincerely,

Eric A. Gustafson
Regional Manager
Environmental Cleanup and Brownfields Program

cc: Grant Dufficy (USEPA)
Joseph Gormley, Jr., P.E.
John O'Hara, P.G. - DEP
Kristie Shimko - DEP
Clem DeLattre - WM
Doug Moorhead - OCC
Kim Bontrager - DEP
File

EAG:JO:trs

APPENDIX A-3

JULY 2, 2012 TRINITY/GOLDER LETTER

Golder Associates

July 2, 2012 Project No. 073-6009-100

Eric A. Gustafson
Regional Manager
Environmental Cleanup and Brownfields Program
Pennsylvania Department of Environmental Protection
230 Chestnut Street
Meadville, PA 16335

RE: RESPONSE TO COMMENTS
CLEANUP PLAN-SOUTH PLANT SITE - DISAPPROVAL
TRINITY INDUSTRIES, INC. FACILITY ID NO. 731732
BOROUGH OF GREENVILLE, MERCER COUNTY

Dear Mr. Gustafson:

On behalf of Trinity Industries, Inc. (Trinity), Golder Associates Inc. (Golder) has prepared the following letter to respond to the Pennsylvania Department of Environmental Protection's (PADEP) April 27, 2012 letter disapproving the January 30, 2012 Cleanup Plan for the South Plant Site (Site) located at 100 York Street in Greenville, Pennsylvania.

In its April 27, 2012 letter, the PADEP noted that the Cleanup Plan was submitted in accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2) and constitutes a Cleanup Plan as defined in Chapter 3, Section 304 of the Act. However, the PADEP noted several deficiencies in the Cleanup Plan and disapproved it in accordance with the provisions of Act 2.

In response to the disapproval letter, Trinity and Golder met with the PADEP on June 1, 2012 at its office in Meadville, Pennsylvania to discuss the comments, present preliminary responses, and agree to a path going forward for revising the Cleanup Plan for PADEP approval. The following responses are based on the discussions held and agreements reached at the meeting.

COMMENTS AND RESPONSES

PADEP April 27, 2012 disapproval letter comments are shown below in bold italics followed by Trinity's responses in plain text.

PADEP Comment No. 1

As indicated in previous submissions to the Department, most of this site contains fill consisting of waste process sand. In several sections of the Cleanup Plan it is stated that the Act 2 Statewide Health Standard (SHS) would be applied to this waste process sand. The SHS is available for soil and groundwater media only. If the waste process sand is non-hazardous and its placement occurred prior to September 7, 1980, closure of the site-wide waste process sand areas can be addressed through demonstrating an Act 2 Site-Specific Standard in accordance with 250 Subchapter D. This may be done through capping and/or excavation to achieve pathway elimination utilizing the Act 2 SHS Medium Specific Concentrations (MSCs) to determine the limits of capping and/or excavation. Under this scenario, Act 2 relief from liability would be limited to the area capped or excavated. Alternatively, Trinity may elect to address the site-wide waste process sand by demonstrating that it meets a risk-based

Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054 USA
Tel: (856) 793-2005 Fax: (856) 793-2006 www.golder.com

numeric Act 2 Site-Specific Standard (SSS). This alternative would require a residual risk assessment following any remediation (e.g., capping, excavation).

Response to PADEP Comment #1

Most of the Site contains grading fill (i.e., historic/structural fill) and not waste process sand. Trinity has previously provided the following information that shows the historic development of the Site and the distinction between grading fill and waste disposal areas including the waste process sand area.

- Final Revised Remedial Investigation Work Plan – October 2007
  - Appendix I – South Plant 1949 Survey Drawing
- Revised Supplemental Investigation Work Plan – South Plant – October 2008
  - Figure 3 – Fill Thickness South Plant
- Revised Remedial Investigation Report – South Plant – Mar 2010
  - Figure 2-7 – Historical Aerial Photographs
  - Figure 4-1 – Site Geologic Cross Sections
  - Appendix D – Historical Documentation of Waste Sand Disposal Area and Site Drainage

As shown on the above documents and described in the June 1, 2012 meeting with the PADEP, the northeast and north central portions of South Plant were developed first starting in 1911, after which plant expansion continued to the west and to the south. Grading fill was used to level the Site prior to development, construction, and startup of the operations that generated the waste process sand. At least for the northeast and north central portions of South Plant, waste sand wasn't even available until after production operations started. The furthest extent of Site development can be seen on the historic aerial for 1968, which includes the waste process sand disposal area. Therefore, it can be concluded that the grading fill was placed before September 7, 1980.

Figure 1A (see attachment) shows the depth and extent of fill across the Site. This figure shows a clear distinction between grading fill used to level the Site for development and the historic disposal areas (i.e., waste process sand disposal area and the Old Ballfield area).

Figure 1B (see attachment) shows the proposed excavation areas from the Cleanup Plan in relation to the types of fill encountered at the Site. This figure shows that both the grading fill and waste disposal areas have been investigated and that releases within the grading fill have been identified and delineated.

In the Revised Cleanup Plan Trinity will provide information to demonstrate the following:

- Grading fill was placed on-Site prior to operations and the furthest extent of this fill was placed before September 7, 1980
- The waste process sand identified in the RI Report is separate and distinct from the grading fill
- On-Site releases to grading fill have been identified and delineated

From our meeting discussions, Trinity understands that PADEP's guidelines for addressing historic fill are evolving and that the current guidelines do not allow the use of Statewide Health Standards (SHS) for historic fill. Therefore, Trinity will revise the Cleanup Plan to note that the Site Specific Standard will be used for those locations where 1) grading fill and/or soils have been impacted by releases and 2) are being addressed in accordance with the 2006 Consent Order and Agreement (COA). The Site Specific Standard will be pathway elimination through 1) excavation of impacted grading fill/soil within the former operation/drainage areas and 2) capping of the former disposal areas. The impacted

grading fill/soil areas are defined as those areas with multiple related exceedances of the Statewide Health Standards (SHSs) and they are generally defined by the limits of grading fill/soil exceeding 450 mg/kg of lead.

For all other areas of the Site, Trinity will consider a residual risk assessment to 1) demonstrate that the remaining grading fill/soils meet a risk-based numeric standard for non-residential use and 2) obtain relief from liability under Act 2.

Comment No. 2

Table 2-1 titled, "Summary of COC Exceedences by AOC," indicates that manganese is a naturally occurring contaminant. at AOC-13 for 'surface soils'. However, on May 13, 2011, Trinity acknowledged that the entire site is situated on historical fill. Therefore, a conclusion that manganese in fill is naturally occurring is inappropriate and should be revised in the future submittal.

Response to PADEP Comment #2

In the Revised Cleanup Plan, Trinity will update the text to note that this and similar manganese concentrations are indicative of background concentrations in on-Site soil or grading fill rather than evidence of a release. In addition, the text will note that these concentrations are below the Pennsylvania Clean Fill criteria of 31,000 mg/kg for manganese (PADEP Management of Fill Policy; Document # 258-2182-773 - Table FP-1b Clean Fill Concentration Limits For Metals and Inorganics).

Comment No. 3

In accordance with 25 Pa. Code §250.410(b), the remediator should submit the details of the proposed in-situ (soil) stabilization discussed in both the main report summary and Appendix C, Section 02221, Subsection 3.04(A) (3). Additionally, the remediator should provide the details of the plans for the excavated material associated with the sedimentation basin (i.e. sampling, storage, and disposal).

Response to PADEP Comment #3

In the Cleanup Plan, Trinity proposed insitu stabilization as an alternative for addressing impacted grading fill/soils that were potentially below the water table in the former Pickling Area. In the Revised Cleanup Plan, Trinity will provide additional details regarding insitu soil stabilization including vendor screening, results of bench-scale treatability studies, and performance requirements.

In addition, Trinity will provide the requested details regarding the plans for management of the excavated material associated with the sedimentation basin (i.e. sampling, staging, and disposal) in the Revised Cleanup Plan.

Comment No. 4

Outfalls OF-5 and OF-6 are included in the sampling plan, but are not depicted on any of the drawings. These should be included in accordance with 25 Pa. Code §250.410 in the revised report.

Response to PADEP Comment #4

In accordance with 25 Pa. Code §250.410, Trinity provided adequate design plans and specifications and post remediation care/sampling requirements for PADEP to evaluate the remedy. There is no specific reference in §250.410 that requires the inclusion of all post-construction monitoring points in the Cleanup Plan. For most Act 2 sites these specific details are generally not included until the final post remediation monitoring plan, which is part of the Final Report. However, Trinity will add the locations for outfalls OF-5 and OF-6 to the design drawings and sampling plan figures for the Revised Cleanup Plan and will also include them, as required, in the Final Report.

Comment No. 5

Because the Cleanup Plan proposes to leave waste in place below the water table, in order for the Department to approve this approach, Trinity must perform surface water sampling to ensure that the waste material is not currently impacting Mathay Run and the Old Erie Canal above Chapter 16 and Chapter 93 surface water criteria. Samples taken from Mathay Run and the Old Erie Canal should be collected during both low flow periods and after storm events to evaluate the impact of diffuse flow of groundwater to the streams during these conditions. Sampling points should be appropriately stationed where the impacts of groundwater to surface water would be most apparent (i.e. disposal areas adjacent to the stream). The results from the sampling should be included in the revised Cleanup Plan.

Response to PADEP Comment #5

The majority of waste in the disposal areas is above the water table. The historical records presented in the Remedial Investigation (RI) Report and discussed above show that waste was placed on the surface adjacent to the flood control berm and covered. The records do not indicate that waste was buried in excavated trenches or pits. Therefore, any waste that is found within the groundwater has occurred from the filling of low lying areas in the former flood plain and the subsequent rise in groundwater levels.

Surface water data were collected during the RI and the results were presented in Appendix I-5 of the RI Report. These results showed that there were no exceedances of ambient water quality criteria for aquatic life or human health. As discussed in the June 1, 2012 meeting, Trinity has recently directly compared to the ambient water quality criteria the RI groundwater data (RI Report, Figure 6-7) from those wells that monitor groundwater with the potential to discharge to surface water bodies. This comparison assumes a direct discharge with no dilution. Based on this conservative comparison, several wells have results that are greater than the ambient water quality criteria for human health (three wells for manganese, two wells for PAHs, one well for benzene, and one well for aldrin). However, all of the groundwater results are below the ambient water quality criteria for aquatic life. These results are shown on attached Figure 2. Because the designated use of Mathay Run is a warm water fishery (WWF), the ambient water quality criteria for aquatic life are the appropriate surface water criteria.

To further demonstrate that there are no impacts to surface water from on-Site waste, Trinity will perform additional surface water sampling to confirm the RI results under both low flow conditions and after a storm event. As agreed to at the June 1, 2012 meeting with PADEP, Trinity will include these additional sampling results in the Revised Cleanup Plan.

Comment No. 6

According to the Department's January 13, 2010, disapproval letter concerning the Remedial Investigation Report (South Plant), Trinity was to provide a full and complete ecological assessment based on the appropriate attainment standard selected and include this evaluation in the Cleanup Plan in accordance with 25 Pa. Code §250.311. However, the

Cleanup Plan does not include an ecological assessment. Because the Department has already determined that there is at least one candidate species on the site and Trinity is seeking attainment of the Site-Specific Standard, Trinity must have a qualified individual perform a Site-Specific Ecological Risk Assessment of the site. The report, data, and findings should be included in the revised Cleanup Plan in accordance with 25 Pa. Code §250.402.

Response to PADEP Comment #6

Trinity acknowledges the January 13, 2010 disapproval letter for the RI Report that requested a full and complete ecological risk assessment based on the appropriate attainment standard selected. However, for the record and in the interest of completeness on this issue Trinity also wants to point out that there was additional correspondence related to this subject including the following:

- The March 1, 2010 Response to Comments addressing PADEP's January 13, 2010 disapproval letter and agreeing to perform additional ecological evaluations, as necessary, as part of the Cleanup Plan
- The March 31, 2010 letter from PADEP approving the RI as amended by the Response to Comments
- The March 25, 2011 Cleanup Work Plan proposing to perform additional stormwater drainage and sediment evaluation as part of the pre-design investigations
- The June 7, 2011 letter from PADEP approving the Cleanup Work Plan with no further comments on the proposed sediment evaluation

In addition, it should be noted that PA 25 § 250.405c states that "The baseline risk assessment report is not required if the Department, in its remedial investigation report or cleanup plan approval, determines that a specific remediation measure that eliminates all pathways, other than a no-action remedial alternative, can be implemented to attain the Site-specific standard in accordance with the requirements of attainment demonstration as specified in Subchapter G (relating to demonstration of attainment). A baseline risk assessment is that portion of a risk assessment that evaluates a risk in the absence of the proposed Site-specific measure."

For on-Site soils, Trinity has proposed to either excavate or contain impacted soils and the pathways for human and ecological receptors will be eliminated. Therefore, a baseline risk assessment for soils for either human health or ecology are unnecessary and should not be required as part of this Cleanup Plan.

For sediments in the Old Erie Canal and Mathay Run, the RI data (see attached Figure 3) show that the majority of Constituents of Concern (COCs) exceeding the United States Environmental Protection Agency (USEPA) Region III Biological Technical Assistance Group (BTAG) screening criteria are polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), pesticides, and metals that are not COCs at the Site (see attached Figure 3). In addition, the upstream samples at locations SS-3 and SS-6 show similar exceedances, indicating that the COCs are related to off-Site anthropogenic sources associated with urban stormwater runoff. Furthermore, stormwater evaluations, including dye studies, performed in July 2011 as part of the pre-design investigations showed that there are no direct stormwater discharges from the Site to the Old Erie Canal. Therefore, a baseline risk assessment for sediments for either human health or ecology should not be required as part of this Cleanup Plan.

A more detailed discussion regarding sediment impacts is presented in response to PADEP Comment #7 below.

Comment No. 7

The 2011 "Clean Up Work Plan-South Site" concluded that sediments impacted above the United States Environmental Protection Agency, Region 3, Biological Technical Assistance Group, Freshwater Sediment Screening Benchmarks, may be site related (detections of contaminants found in sediments correlate to AOC-S3 for lead, manganese, and zinc), Trinity now concludes in the Cleanup Plan that the impacts to sediments are not `site-related' and are likely related to off-site impacts. However, Trinity had a National Pollutant Discharge Elimination System (NPDES) permit (No. PAR808323) for discharge to Erie Extension Canal for Outfalls No. 1, No. 2, and No. 3. It is noted on the NPDES application that these outfalls drained approximately 55 acres of the facility to the Erie Extension Canal. Additionally, Trinity Industries-North Plant Site's stormwater discharges into the Old Erie Canal, as noted by Trinity in their "Response to Comments & Revised RI Report-North Plant" letter dated September 2, 2011. Therefore, Trinity will need to address the sediment impacts in accordance with 25 Pa. Code §§250.311 and 250.402, as well as the guidance provided in Section IV.H of the Land Recycling Technical Guidance Manual.

Response to PADEP Comment #7

Trinity has always maintained that the majority of impacts seen in sediment are related to off-Site sources. Trinity's conclusions and position have not changed with respect to this issue. In response to PADEP questions and concerns, Trinity agreed to perform additional evaluations to determine if observed lead and zinc impacts were potentially related to releases from AOC-S3.

Section 2.7.2 of Trinity's Cleanup Work Plan for the South Plant stated the following:

> *"Sediment results from the streams were compared to the USEPA Region 3 Biological Technical Assessment Group's (BTAG) Freshwater Sediment Benchmarks, which are screening criteria and not promulgated standards. Several SVOCs, pesticides, and metals exceeded the screening criteria in sediment samples. A high number of exceedances were found in upstream samples of both Mathay Run and the Old Erie Extension Canal, which suggests a potential off-Site source(s) for these COCs. It should also be noted that these COCs are frequently anthropogenic and typically found in urban streams and sediments.*
>
> *Stream sediment COCs exceeding the screening criteria are shown in Table 5-4 of the RI Report (Golder 2010). Based on the distribution and concentrations of these COCs found in sediment, the COCs appear to be related to point source and non-point source (e.g., stormwater) discharges in the urban watershed. With the exception of lead, manganese, and potentially zinc, the sediment COCs do not correspond with on-Site COCs and; therefore, appear to be from off-Site sources. Additional characterization will be necessary to determine the extent of the correlation, if any, between the presence of the COCs lead, manganese, and zinc on-Site and their presence in potentially impacted sediments."*

Section 4.3 of the Cleanup Work Plan further stated the following:

> *"The sediment benchmarks are screening criteria and not cleanup standards. Exceedances of the screening criteria indicate there is a potential risk to aquatic biota, but they do not trigger sediment cleanups actions without additional consideration.*
>
> *For the sediment areas, Trinity proposes the following response actions to determine if COCs in sediment are related to Site activities and if further actions are warranted.*
>
> - *Additional investigations of the Site drainage systems and outfalls leading to Old Erie Canal*

- *Further evaluation of the existing sediment data versus sediment databases and sediment cleanup criteria"*

The drainage system investigation was performed as part of the pre-design investigations and the results of this evaluation were presented in the Cleanup Plan. The drainage evaluation concluded that there was no direct discharge of stormwater from the Site to the Old Erie Canal or Mathay Run, therefore no further evaluation was necessary.

In response to PADEP's concerns about the sediment, Trinity is providing the following additional information to support the conclusion that sediment impacts are not related to releases of hazardous substances migrating from the Site.

Additional Drainage System and Outfall Investigations

As part of the pre-design investigations, Trinity performed a stormwater investigation that included inspections of the stormwater drains in the vicinity of AOC-S3 to determine if they are hydraulically connected to the Site outfall that discharges to the Old Erie Canal (OF1). An NPDES Storm Water General Permit (Appendix A, RI Report) and a historic Site sketch (Appendix B, RI Report) indicated that stormwater discharged directly to the Old Erie Extension Canal through an outfall named OF-1, which was located to the east of the Main Office/former parking area. Based on the location of this outfall in relation to high COC concentrations found in sediment sample SS-S5, PADEP requested additional investigations to determine if there was a link between observed soil impacts in the Former Operating Areas and COCs in the sediment of the Old Erie Extension Canal, specifically lead, manganese, and zinc.

In response to PADEP's request, Golder performed a Site inspection in March 2011 when vegetation remained in early emergent stages and did not locate any indication of an outfall pipe in this area. In addition, Golder performed a stormwater drainage evaluation in July 2011 as part of the pre-design investigations. During the drainage evaluation, dye was discharged to a stormwater drain (DT-S1) in the former parking area that was believed to discharge directly to outfall OF-1 and the Old Erie Extension Canal. However, despite extensive observation during and after dye discharge, dye was not seen entering the Old Erie Extension Canal, Mathay Run, or any other locations on-Site. Photographs of the dye test and site drainage features are shown on attached Figure 4. As noted in the Cleanup Plan, on-Site observations during the dye tests showed that the outlet pipe from DT-S1 drains to a manhole directly east of OF-1 that redirects the flow on-Site to the south and not towards the Old Erie Extension Canal.

Furthermore, a historic surveyed drawing presented in Appendix D of Revised RI Report shows that the Old Erie Canal Extension was dredged, widened, and diked in 1955 to redirect eastern Greenville stormwater runoff from the Shenango River towards Mathay Run. The drawing also shows that the canal was re-dredged in 1975. However, the drawing does not show an outfall in the vicinity of OF-1 discharging to the canal.

Because there are no known surveyed drawings showing outfall OF-1 entering the canal and no known records indicating the outfall was removed from this location, it is possible that the outfall location was errantly marked on sketches associated with stormwater permits, with the error perpetuated on subsequent documents. Based on the field observations, outfall OF-1 is likely the observed manhole and stormwater from the Site operational areas does not discharge into the Old Erie Extension Canal.

Additional Sediment Data Evaluation

Prior to the June 1, 2012 meeting, Trinity compared the sediment data to additional recognized screening criteria, the Consensus Based Sediment Quality Guidelines (MacDonald, Ingersoll, Berger, 2000), which include both Threshold Effect Concentrations (TECs) and Probable Effect Concentrations (PECs). The TECs are very conservative and similar to the BTAG screening criteria. The PECs are

less conservative. The data and the screening criteria are shown on attached Figure 3. When the sediment data are compared to the less conservative PECs, exceedances remain at location SS-S5 as well as upstream sample locations SS-S3 and SS-S6 for parameters including PAHs, gamma-chlordane, lead, and zinc.

In its Preliminary Data Summary of Urban Storm Water Best Management Practices (USEPA, 1999), the USEPA noted that "Urban runoff was also a significant source of impairment in rivers and lakes. The percent of total impairment attributed to urban runoff is substantial." The "pollutants associated with urban runoff potentially harmful to receiving waters fall into the categories listed below:

- Solids
- Oxygen-demanding substances
- Nitrogen and phosphorus
- Pathogens
- Petroleum hydrocarbons
- Metals
- Synthetic organics."

Table 4-2 of this report, "Sources of Contaminants in Urban Storm Water Runoff" identifies the following contaminant sources:

- Metals - Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, corroding metal surfaces, combustion processes
- Pesticides and Herbicides - Residential lawns and gardens, roadsides, utility right-of-ways, commercial and industrial landscaped areas, soil wash-off
- Oil and Grease/Hydrocarbons (PAHs) - Roads, driveways, parking lots, vehicle maintenance areas, gas stations, illicit dumping to storm drains

Furthermore, Table 4-7 of this report, "Most Frequently Detected Priority Pollutants in Nationwide Urban Runoff Program Samples (1978-83)" shows the following percentages of pollutants detected in urban runoff:

<u>Metals</u>
- lead, zinc, and copper detected in over 90 percent of the samples
- chromium and arsenic detected in over 50 percent of the samples
- cadmium, nickel, and cyanides detected in over 20 percent of the samples

<u>Pesticides</u>
- chlordane and lindane detected in over 15 percent of the samples

<u>PAHs</u>
- pyrene, phenanthrene, chrysene, and flouranthene detected in at least 10 percent of the samples

Based on the above information, it appears that the impacts seen at locations SS-S3, SS-S5, and SS-S6 are consistent with types of pollutants related to urban runoff.

While there are higher impacts at location SS-S5, they appear to be related to a sediment deposition area in the Old Erie Extension Canal. On-Site observations during the dye study and during a recent site visit show that the section of the Old Erie Extension Canal in the vicinity of SS-S5 is heavily vegetated, which is acting as an impediment to surface water flow (see Figure 4). Therefore, it is very likely that this vegetation causes suspended solids and other pollutants discharging from the Greenville storm sewers into the canal to settle out in this area. However, these conditions would not have been obvious in December 2007 when the RI sediment samples were collected because the vegetation would have undergone seasonal die-off.

Conclusions

Based on the data, field observations, historic site plans, and USEPA stormwater studies, the sediment COCs appear to be related to urban stormwater runoff from eastern Greenville since 1975 and the high COC levels observed in SS-S5 appear to be related to the effects of a heavily vegetated sediment deposition area. Therefore, Trinity's current position is that observed exceedances in sediment are not related to Site activities and no further response actions are warranted for sediment.

At the June 1, 2012 meeting, PADEP noted that the Department has photographs that show an outfall from the Site discharging to the Old Erie Canal in the vicinity if OF-1 and agreed to provide this to Trinity. After Trinity receives this photograph, it will be reviewed and considered along with all the other observations/records to determine whether there is sufficient evidence for changing the current position and addressing off-Site sediments in the Revised Cleanup Plan.

Comment No. 8

Trinity proposes to use a Site-Specific Standard of 3,600 ug/L for Manganese for groundwater migrating off-site. This proposal is contrary to Trinity's conclusion that Mathay Run and the Old Erie Canal act as a hydraulic barrier for contaminants migrating off the South Plant. Moreover, the proposal is specifically prohibited by Paragraph (6)(b) of the 2006 Consent Order and Agreement (COA) which limits Trinity to demonstrating either the Background or the Residential Used Aquifer, Statewide Health Standard at the property line and beyond.

Response to PADEP Comment #8

Trinity acknowledges the requirements of the COA and proposes to use either a SHS or a background standard for manganese in groundwater.

Trinity will perform additional groundwater monitoring to verify the hydraulic barrier and demonstrate attainment of the SHS standard at the point of compliance (e.g., property boundary). If the monitoring indicates exceedances of the SHS at the point of compliance, Trinity will develop a background standard for manganese in accordance with PA 25 §250.707(a)(3). At a minimum, Trinity will use 12 samples from a combination of monitoring wells, including upgradient locations, to determine a background concentration for manganese in groundwater.

Comment No. 9

Monitoring well MW-13 and MW-14 have only one water level measurement which was performed in September 2011. In addition, these monitoring wells had no sampling analysis conducted for Site Contaminants of Concern (COCs). Because these wells were installed after the submittal and subsequent approval of the Remedial Investigation Report, please refer to 25 Pa. Code §250.408(e) for the appropriate number of sampling events as these wells are being utilized for additional site characterization.

Response to PADEP Comment #9

In accordance with the approved Cleanup Work Plan, Trinity collected several rounds of water level data at the South Plant to demonstrate that groundwater is discharging to Mathay Run and that the creek is acting as a hydraulic barrier. This additional data is shown in attached Figure 5 and will be incorporated into the Revised Cleanup Plan. The data was not available for the draft Cleanup Plan that was placed in the repositories for public comment and was not added to the document in the interest of time when the document was finalized for submittal to the PADEP.

While the additional water level data show higher water levels across Mathay Run and indicate a hydraulic barrier may exist, the data is not conclusive. Therefore, Trinity will collect additional groundwater level measurements and analytical data in conjunction with the surface water sampling noted above to further verify that Mathay Run is acting as a hydraulic barrier.

Trinity will perform the sampling and include these results in the Revised Cleanup Plan. If the results indicate that the groundwater is causing exceedances of the surface water criteria or that Site related exceedances are traveling off-Site under Mathay Run, then Trinity will propose modifications to the Cleanup Plan to address these issues.

Comment No. 10

This report was sealed by a Professional Engineer but not a Professional Geologist. The Cleanup Work Plan Approval with Modifications letter (June 7, 2011) included language that directed Trinity to certify the Engineering plans/details in the Cleanup Plan by a Professional Engineer and any groundwater aspects to be certified by a Professional Geologist. Therefore, the revised Cleanup Plan should be certified by, both, a Professional Geologist and a Professional Engineer.

Response to PADEP Comment #10

Trinity will include a certification by a Pennsylvania geologist for the discussions /interpretations of Site groundwater in the Revised Cleanup Plan.

General Comments Not Related to the Above-Mentioned Deficiencies:

Trinity concludes that Mathay Run/Old Erie Canal is a hydraulic barrier which intercepts all groundwater contamination leaving the site; thus, preventing groundwater contamination off-site. However, data should be provided in the report to support this conclusion. At a minimum, Trinity should evaluate this conclusion by providing the following: I) Two quarterly groundwater samples and elevations from MW-13 and MW-14 for site COCs; 2) Concurrent samples and elevations obtained from monitoring wells adjacent to MW-12 and MW-13; 3) Concurrent stream gauge measurements should be obtained; and 4) Concurrent stream samples (for site related COCs) should be collected.

Response to PADEP General Comments

See response to Comment #9

PATH GOING FORWARD

As agreed during the June 1, 2012 meeting, the following will be performed:

- Trinity will perform additional groundwater and surface water monitoring to demonstrate that Mathay Run is acting as a hydraulic barrier to impacted groundwater and that groundwater is not causing any exceedances of ambient water quality criteria. Assuming

that both low flow and storm flow conditions occur, the additional surface water monitoring will be performed from July through October.

- PADEP will provide photographs and field notes related to the outfall the Department purportedly observed at the Site discharging to the Old Erie Canal Extension. If the photographs/notes clearly confirm a stormwater pathway from the Site to the Old Erie Extension Canal, Trinity will develop a sampling approach and will perform additional sediment evaluations.
- After the above monitoring/evaluations are complete, Trinity will prepare and submit a Revised Cleanup Plan for review and approval by PADEP. Assuming that the groundwater/surface water monitoring is performed in July and October, that there are no further sediment evaluations, and that there is no additional public comment period, Trinity anticipates submitting the Revised Cleanup Plan in January, 2013.
- In the interest of demonstrating continued progress at the South Plant, Trinity will perform appropriate construction permitting tasks in parallel with the preparation and submittal of the Revised Cleanup Plan.

Trinity and Golder believe this correspondence accurately reflects the discussions and agreements made during our June 1, 2012 meeting and serves as a sufficient record of such. If you have any questions or comments regarding the above, please do not hesitate to contact Terry Barrett, of Trinity, or Joe Gormley.

GOLDER ASSOCIATES INC.

Joseph B. Gormley, Jr., P.E.
Senior Consultant, Project Coordinator

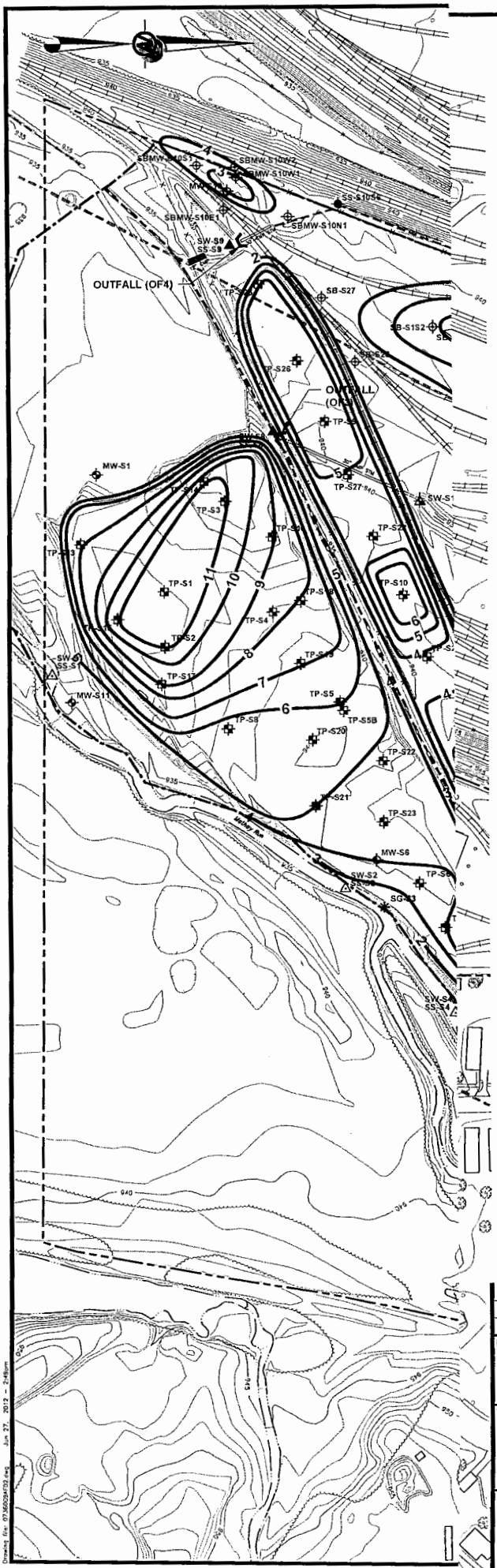
Mark Haney
Project Director

cc: Terry Barrett, P.G., Trinity Industries, Inc. (Electronic Copy)
Grant Dufficy, USEPA
John O'Hara, DEP
Kristie Shimko, DEP
Clem DeLattre, WM
Doug Moorhead, OCC
Kim Bontrager, DEP File

Attachments:

Figure 1A – Fill Thickness
Figure 1B – Fill Thickness and Proposed Excavation Depths
Figure 2 – Groundwater Samples with Concentrations Above Act 2 Standards
Figure 3 – Sediment Samples with Results Over Screening Criteria
Figure 4 – Site Drainage Features and Dye Studies
Figure 5 – Groundwater Contour Maps 2009 and 2011

JBG/MH/bjb



LEGEND

- PROPERTY LINE
- RAILS
- 940 — CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- SURVEY BOUNDARY (SEE REFERENCE 1)
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER (SW) AND SEDIMENT SAMPLE (SS) SAMPLE LOCATION
- SURFACE WATER (SW) AND SURFACE SOIL (SS) SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- STAFF GAUGE
- BUILDING OR SLAB
- STREAM OR CREEK
- 5 — FILL THICKNESS CONTOUR

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-86 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BAIRD, INC, DATED AUGUST 25, 2011.

80 0 80 160
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

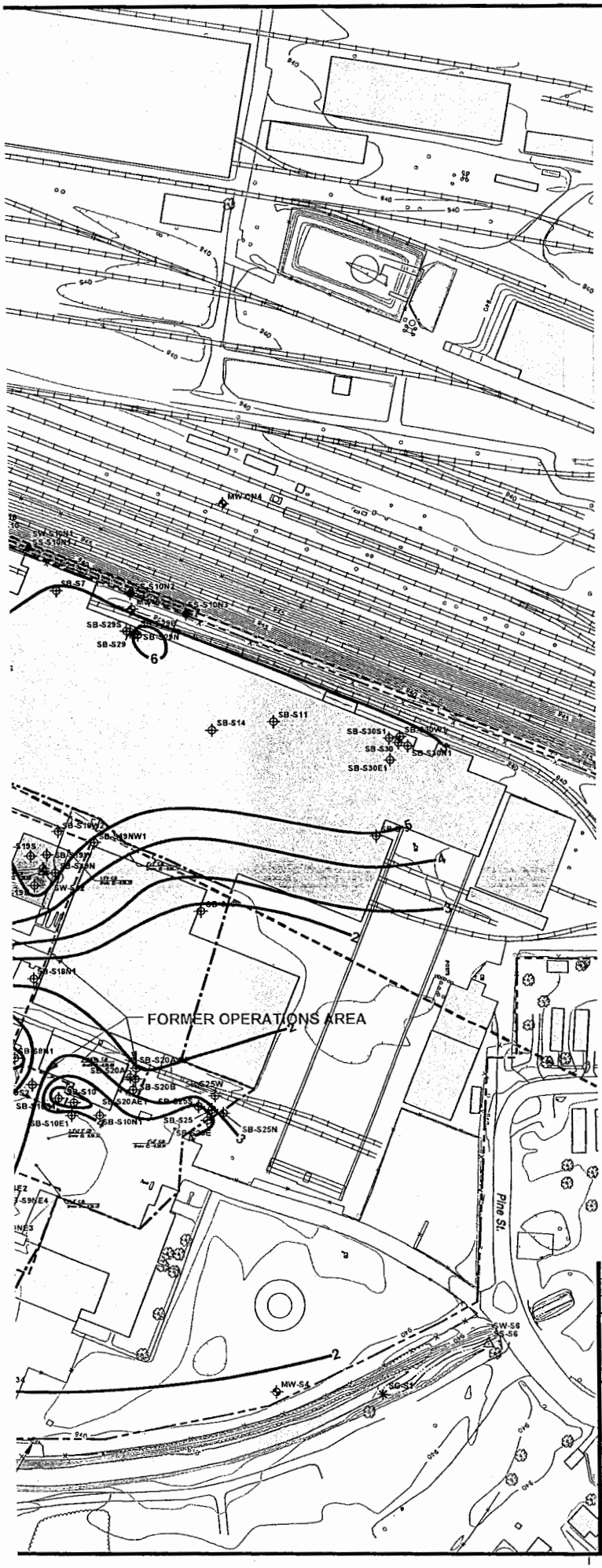
PROJECT
CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE
FILL THICKNESSES

NJ Authorization #24GA28029100
Golder Associates
Philadelphia USA

PROJECT No.		073-60D9	FILE No.		D7360D9AF02
DESIGN	VEF	06/27/12	SCALE	AS SHOWN	REV. 0
CADD	RG	06/27/12	FIGURE 1A		
CHECK	VEF	06/27/12			
REVIEW	JBG	06/27/12			

Drawing file: 07360D9AF02.dwg Jun 27, 2012 - 2:48pm



LEGEND

- PROPERTY LINE
- RAILS
- 940 — CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- SURVEY BOUNDARY (SEE REFERENCE 1)
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER (SW) AND SEDIMENT SAMPLE (SS) SAMPLE LOCATION
- SURFACE WATER (SW) AND SURFACE SOIL (SS) SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- STAFF GAUGE
- BUILDING OR SLAB
- STREAM OR CREEK
- EXTENT OF AREAS TO BE ADDRESSED BY EXCAVATION OF IMPACTED SOILS AND BACKFILLING (SEE NOTE 1)
- EXTENT OF DISPOSAL AREA TO BE CAPPED (SEE NOTE 2)
- 2 FT EXCAVATION
- 0-2 FT SURFACE SOIL REMOVAL
- 4 FT EXCAVATION
- 6 FT EXCAVATION
- 8 FT EXCAVATION
- 6 FT EXCAVATION AND IN-SITU SOIL STABILIZATION FROM 6-20 FT
- 5 — FILL THICKNESS CONTOUR

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-88 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BAIRD, INC, DATED AUGUST 25, 2011.

80 0 80 160
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

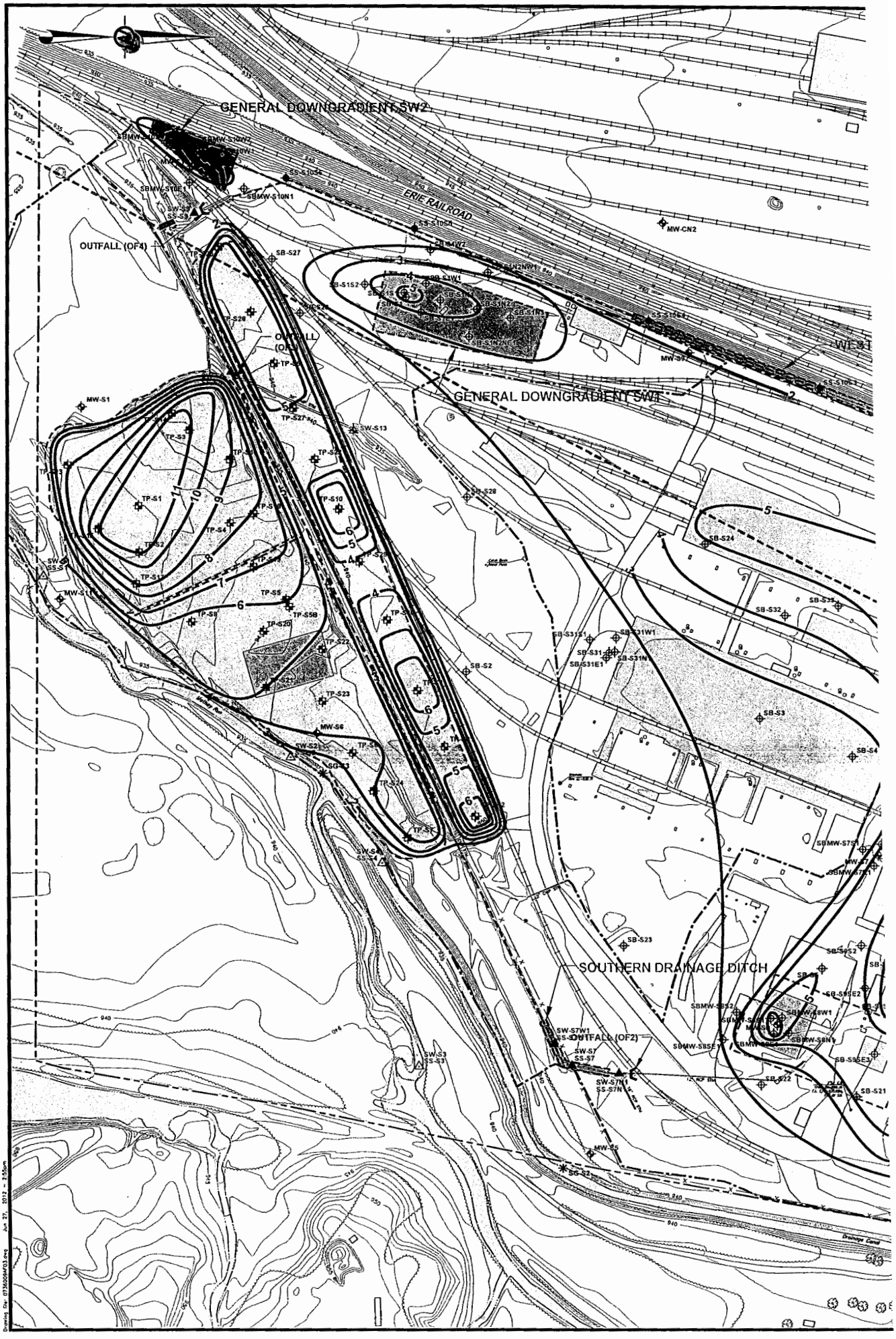
PROJECT
CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE
FILL THICKNESS AND PROPOSED EXCAVATION DEPTHS

NJ Authorization #24GA28025100
Golder Associates
Philadelphia USA

PROJECT No.		073-6009	FILE No.		0736009AF03
DESIGN	VEF	06/27/12	SCALE	AS SHOWN	REV. 0
CADD	RG	06/27/12			
CHECK	VEF	06/27/12			
REVIEW	JBG	06/27/12			

FIGURE 1B


GENERAL DOWNGRADIENT SW2
ERIE RAILROAD
OUTFALL (OF4)
OUTFALL (OF3)
GENERAL DOWNGRADIENT SW1
SOUTHERN DRAINAGE DITCH
OUTFALL (OF2)
WEST

NOTES

1.) ANALYTICAL RESULT IN BOLD TYPE FACE INDICATES THAT THE DETECTED CONCENTRATION IS ABOVE THE PENNSYLVANIA STATEWIDE HEALTH STANDARD, MEDIUM-SPECIFIC CONCENTRATIONS (MSCs) FOR ORGANIC AND INORGANIC REGULATED SUBSTANCES IN GROUNDWATER FOR RESIDENTIAL, USED AQUIFERS, TDS ≤ 2,500 PPM.

2.) THE RESULTS FOR BOTH PRIMARY AND DUPLICATE SAMPLES WHEN COLLECTED ARE SHOWN FOR THE APPLICABLE SAMPLE LOCATION AND SAMPLING PERIOD.

3.) THE SURFACE WATER HUMAN HEALTH CRITERIA NOTED FOR MANGANESE ONLY APPLIES TO PUBLIC WATER SUPPLY (PWS) USES.

4.) WELLS WITH THE POTENTIAL TO DISCHARGE TO SURFACE WATER BODIES ARE SHOWN IN BLUE CHEMBOXES THAT INCLUDE SURFACE WATER CRITERIA FOR COMPARISON PURPOSES ONLY.

LEGEND

- PROPERTY LINE
- RAILS
- 940 CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- SURVEY BOUNDARY (SEE REFERENCE 1)
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER (SW) AND SEDIMENT SAMPLE (SS) SAMPLE LOCATION
- SURFACE WATER (SW) AND SURFACE SOIL (SS) SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- STAFF GAUGE
- BUILDING OR SLAB
- STREAM OR CREEK

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-382D GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-86 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-382D GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BAIRD, INC, DATED AUGUST 25, 2011.

MW-CN3

Class	Regulated Substance	Units	GW MSC	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	8	7
Inorganic	Arsenic (Dissolved)	µg/L	10	6.8	6.5
Inorganic	Lead (Total)	µg/L	5	1.4	< 0.39
Inorganic	Lead (Dissolved)	µg/L	5	< 0.056	< 0.1
Inorganic	Manganese (Total)	µg/L	300	511	630
Inorganic	Manganese (Dissolved)	µg/L	300	485	628

MW-S2

Class	Regulated Substance	Units	GW MSC	Result March 2008	Result April 2008	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	14.8	5	3.7	2.8
Inorganic	Arsenic (Dissolved)	µg/L	10	6.5	4.5	4	2.9
Inorganic	Lead (Total)	µg/L	5	13	3.2	< 0.46	< 0.76
Inorganic	Lead (Dissolved)	µg/L	5	< 0.096	< 0.16	< 0.13	0.31
Inorganic	Manganese (Total)	µg/L	300	1,880	1,560	1,330	1,510
Inorganic	Manganese (Dissolved)	µg/L	300	1,630	1,560	1,350	1,540

MW-S12

ed Substance	Units	GW MSC	Result March 2009	Result May 2009
otal)	µg/L	10	2.4 / 3	4.5
issolved)	µg/L	10	2.6 / 2.6	2.9
l)	µg/L	5	1.1 / 1.1	1.9
olved)	µg/L	5	< 0.14 / < 0.15	< 0.28
(Total)	µg/L	300	41.2 / 41.2	860
(Dissolved)	µg/L	300	34.7 / 31.8	923

MW-CN1

Class	Regulated Substance	Units	GW MSC	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	0.4	< 0.31
Inorganic	Arsenic (Dissolved)	µg/L	10	0.8	< 0.14
Inorganic	Lead (Total)	µg/L	5	1.8	0.7
Inorganic	Lead (Dissolved)	µg/L	5	< 0.02	< 0.14
Inorganic	Manganese (Total)	µg/L	300	97	118
Inorganic	Manganese (Dissolved)	µg/L	300	94.7	112

MW-S3

Class	Regulated Substance	Units	GW MSC	Result March 2008	Result April 2008	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	5.2	15.2	6.8	6.8
Inorganic	Arsenic (Dissolved)	µg/L	10	4	5.8	5.2	4.6
Inorganic	Lead (Total)	µg/L	5	1.7	1.3	< 0.3	< 0.44
Inorganic	Lead (Dissolved)	µg/L	5	< 0.075	< 0.099	< 0.082	0.25
Inorganic	Manganese (Total)	µg/L	300	1,940	2,160	1,520	1,760
Inorganic	Manganese (Dissolved)	µg/L	300	1,890	2,110	1,480	1,700
SVOC	Dibenzo(a,h)anthracene	µg/L	0.09	0.11	< 0.033	-	-

MW-S8

SC	Surface Water Criteria (for SW-S4) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2008	Result April 2008	Result March 2009	Result May 2009
	150	340	50	8.7	2.4	2.3	2.5
	150	340	50	4.6	3	2.2	1.2
	1.9	50.0	N.S.	23.6	1.6	< 0.11	< 0.49
	1.9	48.3	N.S.	< 0.073	< 0.1	< 0.15	0.29
	N.S.	N.S	1,000	1,190	1,140	1,360	1,570
	N.S.	N.S	1,000	1,100	1,140	1,290	1,570
17	0.1	3	0.00013	0.023	< 0.010	-	-

ılth	Result March 2008	Result April 2008		Result March 2009	Result May 2009
	30.8	8.1	8.6	7.7	12
	8.3	8.3	8.7	6.6	8.8
	89.2	1.1	1.2	< 0.15	< 0.97
	< 0.091	< 0.14	< 0.1	< 0.1	0.25
	904	241	250	215	242
	282	249	240	204	232
	< 0.042	< 0.042	0.3	-	-
	7.5	< 0.12	0.43	-	-
	0.093	< 0.034	0.26	-	-

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

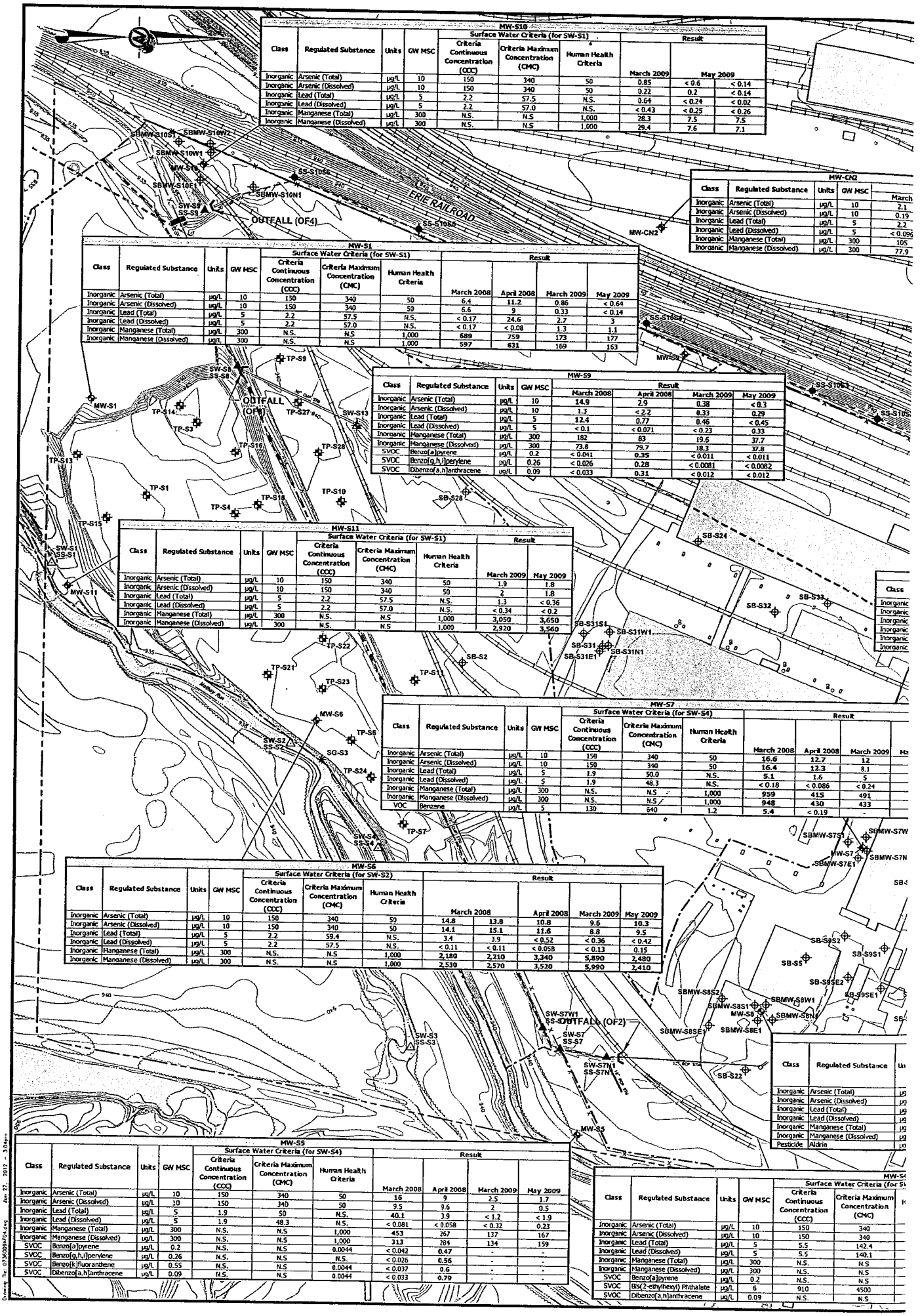
TITLE

GROUNDWATER SAMPLES WITH CONCENTRATIONS ABOVE ACT 2 STANDARDS

NJ Authorization #24GA28029100
Golder Associates
Philadelphia USA

PROJECT No.	073-6009	FILE No.	0736009AF04
DESIGN	JBG 06/27/12	SCALE	AS SHOWN REV. 0
CADD	RG 06/27/12		
CHECK	JBG 06/27/12		
REVIEW	MAH 06/27/12		

FIGURE 2



MW-S10

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for SW-S1) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2009	Result May 2009	
Inorganic	Arsenic (Total)	µg/L	10	150	340	50	0.85	< 0.6	< 0.14
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	50	0.22	0.2	< 0.14
Inorganic	Lead (Total)	µg/L	5	2.2	57.5	N.S.	0.64	< 0.24	< 0.02
Inorganic	Lead (Dissolved)	µg/L	5	2.2	57.0	N.S.	< 0.43	< 0.25	< 0.26
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	1,000	28.3	7.5	7.5
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	1,000	29.4	7.6	7.1

MW-CN2

Class	Regulated Substance	Units	GW MSC	March
Inorganic	Arsenic (Total)	µg/L	10	2.1
Inorganic	Arsenic (Dissolved)	µg/L	10	0.19
Inorganic	Lead (Total)	µg/L	5	2.2
Inorganic	Lead (Dissolved)	µg/L	5	< 0.09
Inorganic	Manganese (Total)	µg/L	300	105
Inorganic	Manganese (Dissolved)	µg/L	300	77.9

MW-S1

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for SW-S1) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2008	Result April 2008	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	150	340	50	6.4	11.2	0.86	< 0.64
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	50	6.6	9	0.33	< 0.14
Inorganic	Lead (Total)	µg/L	5	2.2	57.5	N.S.	< 0.17	24.6	2.7	3
Inorganic	Lead (Dissolved)	µg/L	5	2.2	57.0	N.S.	< 0.17	< 0.08	1.3	1.1
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	1,000	689	759	173	177
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	1,000	597	631	169	163

MW-S9

Class	Regulated Substance	Units	GW MSC	Result March 2008	Result April 2008	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	14.9	2.9	0.38	< 0.3
Inorganic	Arsenic (Dissolved)	µg/L	10	1.3	< 2.2	0.33	0.29
Inorganic	Lead (Total)	µg/L	5	12.4	0.77	0.46	< 0.45
Inorganic	Lead (Dissolved)	µg/L	5	< 0.1	< 0.071	< 0.23	0.33
Inorganic	Manganese (Total)	µg/L	300	182	83	19.6	37.7
Inorganic	Manganese (Dissolved)	µg/L	300	73.8	75.7	18.3	37.8
SVOC	Benzo[a]pyrene	µg/L	0.2	< 0.041	0.35	< 0.011	< 0.011
SVOC	Benzo[g,h,i]perylene	µg/L	0.26	< 0.026	0.28	< 0.0081	< 0.0082
SVOC	Dibenzo[a,h]anthracene	µg/L	0.09	< 0.033	0.31	< 0.012	< 0.012

MW-S11

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for SW-S1) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	150	340	50	1.9	1.8
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	50	2	1.8
Inorganic	Lead (Total)	µg/L	5	2.2	57.5	N.S.	1.3	< 0.36
Inorganic	Lead (Dissolved)	µg/L	5	2.2	57.0	N.S.	< 0.34	< 0.2
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	1,000	3,050	3,650
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	1,000	2,920	3,560

MW-S7

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for SW-S4) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2008	Result April 2008	Result March 2009	Ma
Inorganic	Arsenic (Total)	µg/L	10	150	340	50	16.6	12.7	12	
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	50	16.4	12.3	8.1	
Inorganic	Lead (Total)	µg/L	5	1.9	50.0	N.S.	5.1	1.6	5	
Inorganic	Lead (Dissolved)	µg/L	5	1.9	48.3	N.S.	< 0.18	< 0.086	< 0.24	
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	1,000	959	415	491	
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	1,000	948	430	433	
VOC	Benzene	µg/L	5	130	640	1.2	5.4	< 0.19	-	

MW-S6

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for SW-S2) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2008		Result April 2008	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	150	340	50	14.8	13.8	10.8	9.6	10.3
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	50	14.1	15.1	11.6	8.8	9.5
Inorganic	Lead (Total)	µg/L	5	2.2	59.4	N.S.	3.4	3.9	< 0.52	< 0.36	< 0.42
Inorganic	Lead (Dissolved)	µg/L	5	2.2	57.5	N.S.	< 0.11	< 0.11	< 0.058	< 0.13	0.15
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	1,000	2,180	2,210	3,340	5,890	2,480
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	1,000	2,530	2,570	3,520	5,990	2,410

MW-S5

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for SW-S4) Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	Human Health Criteria	Result March 2008	Result April 2008	Result March 2009	Result May 2009
Inorganic	Arsenic (Total)	µg/L	10	150	340	50	16	9	2.5	1.7
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	50	9.5	9.6	2	0.5
Inorganic	Lead (Total)	µg/L	5	1.9	50	N.S.	40.1	3.9	< 1.2	< 1.9
Inorganic	Lead (Dissolved)	µg/L	5	1.9	48.3	N.S.	< 0.081	< 0.058	< 0.32	0.23
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	1,000	453	267	137	167
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	1,000	313	284	134	159
SVOC	Benzo[a]pyrene	µg/L	0.2	N.S.	N.S	0.0044	< 0.042	0.47	-	-
SVOC	Benzo[g,h,i]perylene	µg/L	0.26	N.S.	N.S	N.S.	< 0.026	0.56	-	-
SVOC	Benzo[k]fluoranthene	µg/L	0.55	N.S.	N.S	0.0044	< 0.037	0.6	-	-
SVOC	Dibenzo[a,h]anthracene	µg/L	0.09	N.S.	N.S	0.0044	< 0.033	0.79	-	-

Class	Regulated Substance	Un
Inorganic	Arsenic (Total)	µg
Inorganic	Arsenic (Dissolved)	µg
Inorganic	Lead (Total)	µg
Inorganic	Lead (Dissolved)	µg
Inorganic	Manganese (Total)	µg
Inorganic	Manganese (Dissolved)	µg
Pesticide	Aldrin	µg

MW-S

Class	Regulated Substance	Units	GW MSC	Surface Water Criteria (for S Criteria Continuous Concentration (CCC)	Criteria Maximum Concentration (CMC)	H
Inorganic	Arsenic (Total)	µg/L	10	150	340	
Inorganic	Arsenic (Dissolved)	µg/L	10	150	340	
Inorganic	Lead (Total)	µg/L	5	5.5	142.4	
Inorganic	Lead (Dissolved)	µg/L	5	5.5	140.1	
Inorganic	Manganese (Total)	µg/L	300	N.S.	N.S	
Inorganic	Manganese (Dissolved)	µg/L	300	N.S.	N.S	
SVOC	Benzo[a]pyrene	µg/L	0.2	N.S.	N.S	
SVOC	Bis(2-ethylhexyl) Phthalate	µg/L	6	910	4500	
SVOC	Dibenzo[a,h]anthracene	µg/L	0.09	N.S.	N.S	

Drawing File: 0736509AP04.dwg Jun 27, 2012 - 3:04pm

NOTES

1.) RESULTS ABOVE THE EPA REGION III BTAG FRESHWATER SEDIMENT SCREENING BENCHMARKS ARE SHOWN IN **BOLD.**

2.) YELLOW HIGHLIGHTED VALUES ARE ABOVE PEC LEVEL.

LEGEND

- PROPERTY LINE
- RAILS
- 940 CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- SURVEY BOUNDARY (SEE REFERENCE 1)
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER (SW) AND SEDIMENT SAMPLE (SS) SAMPLE LOCATION
- SURFACE WATER (SW) AND SURFACE SOIL (SS) SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- STAFF GAUGE
- BUILDING OR SLAB
- STREAM OR CREEK

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-86 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BAIRD, INC, DATED AUGUST 25, 2011.

Parameter	Units	Region III FW BTAG	Consensus-Based Sediment Quality Guidelines: Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	SS-S5 (0 - 0.1, 12/19/2007, N): Result	Qual	RDL
SVOCs							
Acenaphthylene	mg/kg	0.0059			0.27	J	0.24
Anthracene	mg/kg	0.0572			1.4	J	0.23
Benzo[a]anthracene	mg/kg	0.108	0.108	1.05	2.7	J	0.16
Benzo[a]pyrene	mg/kg	0.15	0.15	1.45	3.3	J	0.13
Benzo[g,h,i]perylene	mg/kg	0.17			3.2	J	0.14
Benzo[k]fluoranthene	mg/kg	0.24			3.3	J	0.13
Bis(2-ethylhexyl) Phth	mg/kg	0.18			2.9	J	0.32
Chrysene	mg/kg	0.166	0.166	1.29	3.7	J	0.16
Dibenzo(a,h)anthracen	mg/kg	0.033	0.033	-	0.54	J	0.26
Fluoranthene	mg/kg	0.423	0.423	2.23	8.3	J	0.27
Fluorene	mg/kg	0.0774	0.0774	0.536	1.2	J	0.2
Indeno[1,2,3-cd]pyrene	mg/kg	0.017			2.8	J	0.15
2-Methylnaphthalene	mg/kg	0.0202			0.23	J	0.23
Naphthalene	mg/kg	0.176	0.176	0.561	0.22	J	0.2
Phenanthrene	mg/kg	0.204	0.204	1.17	1.3	J	0.2
Pyrene	mg/kg	0.195	0.195	1.52	5.2	J	0.25
Total PAHs			1.61	22.8	24.46		
Pesticides							
Dieldrin	mg/kg	0.0019	0.0019	0.0618	0.0056	J	0.0015
alpha-Chlordane	mg/kg	0.00324	0.00324	0.0176	0.014	J	0.0013
gamma-Chlordane	mg/kg	0.00324	0.00324	0.0176	0.043		0.0021
PCBs							
Aroclor 1254	mg/kg	0.0598	0.0598	0.676	0.14		0.0059
Aroclor 1260	mg/kg	0.0598	0.0598	0.676	0.093		0.0059
Metals							
Arsenic	mg/kg	9.8	9.79	33	11.6	L	0.041
Cadmium	mg/kg	0.99	0.99	4.98	2.3		0.023
Chromium	mg/kg	43.4	43.4	111	59.1	L	0.02
Copper	mg/kg	31.6	31.6	149	88.7	L	0.021
Iron	mg/kg	20000			34200		0.72
Lead	mg/kg	35.8	35.8	128	270	J	0.0085
Manganese	mg/kg	460			474		0.036
Nickel	mg/kg	22.7	22.7	48.6	33.7		0.017
Zinc	mg/kg	121	121	459	872	L	0.029
Cyanide	mg/kg	0.1			5.7		0.24
Total Organic Carbon	mg/kg	N.S.			55800		167

Parameter	Units	Region III FW BTAG	Consensus-Based Sediment Quality Guidelines: Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	SS-S6 (0 - 0.1, 12/18/2007, N): Result	Qual	RDL
SVOCs							
Anthracene	mg/kg	0.0572			0.99	J	0.12
Benzo[a]anthracene	mg/kg	0.108	0.108	1.05	1.8	J	0.083
Benzo[a]pyrene	mg/kg	0.15	0.15	1.45	1.5	J	0.065
Benzo[g,h,i]perylene	mg/kg	0.17			1.4	J	0.071
Benzo[k]fluoranthene	mg/kg	0.24			0.99	J	0.067
Chrysene	mg/kg	0.166	0.166	1.29	1.7	J	0.083
Fluoranthene	mg/kg	0.423	0.423	2.23	3.9	J	0.14
Fluorene	mg/kg	0.0774	0.0774	0.536	0.68	J	0.1
Indeno[1,2,3-cd]pyrene	mg/kg	0.017			1.2	J	0.074
Phenanthrene	mg/kg	0.204	0.204	1.17	2	J	0.1
Pyrene	mg/kg	0.195	0.195	1.52	3.1	J	0.13
Total PAHs			1.61	22.8	14.68		
Metals							
Iron	mg/kg	20000			21600		0.37
Lead	mg/kg	35.8	35.8	128	38.1	J	0.0043
Manganese	mg/kg	460			858		0.018
Zinc	mg/kg	121	121	459	146	L	0.015
Cyanide	mg/kg	0.1			0.49	J	0.12
Total Organic Carbon	mg/kg	N.S.			5210		84.8

SCALE: 80 0 80 160 FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE

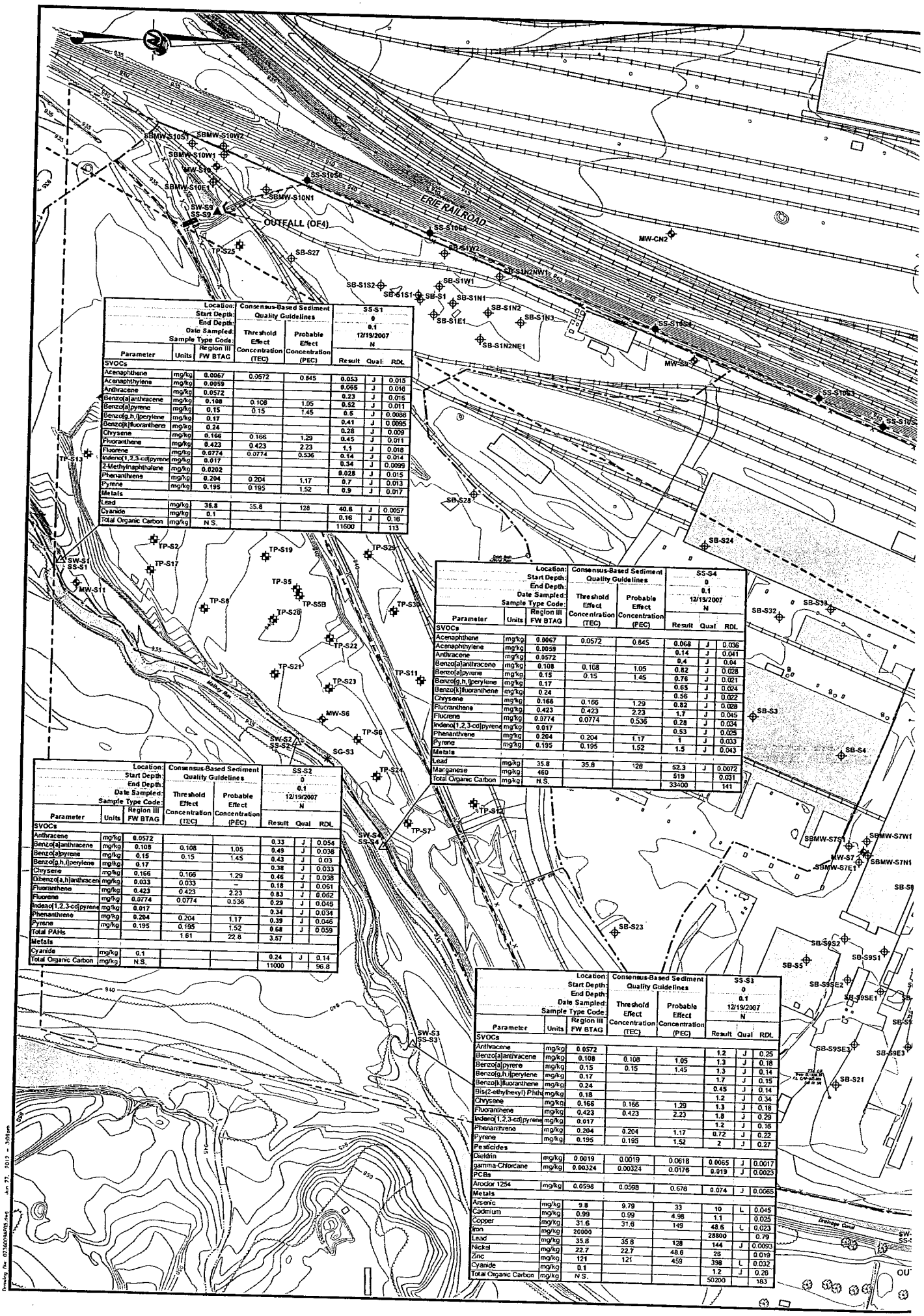
SEDIMENT SAMPLES WITH RESULTS OVER SCREENING CRITERIA

NJ Authorization #24GA28029100

Golder Associates
Philadelphia USA

PROJECT No.		073-6009	FILE No.		0736009AF05
DESIGN	JBG	06/27/12	SCALE	AS SHOWN	REV. 0
CADD	RG	06/27/12			
CHECK	JBG	06/27/12			
REVIEW	MAH	06/27/12			

FIGURE 3

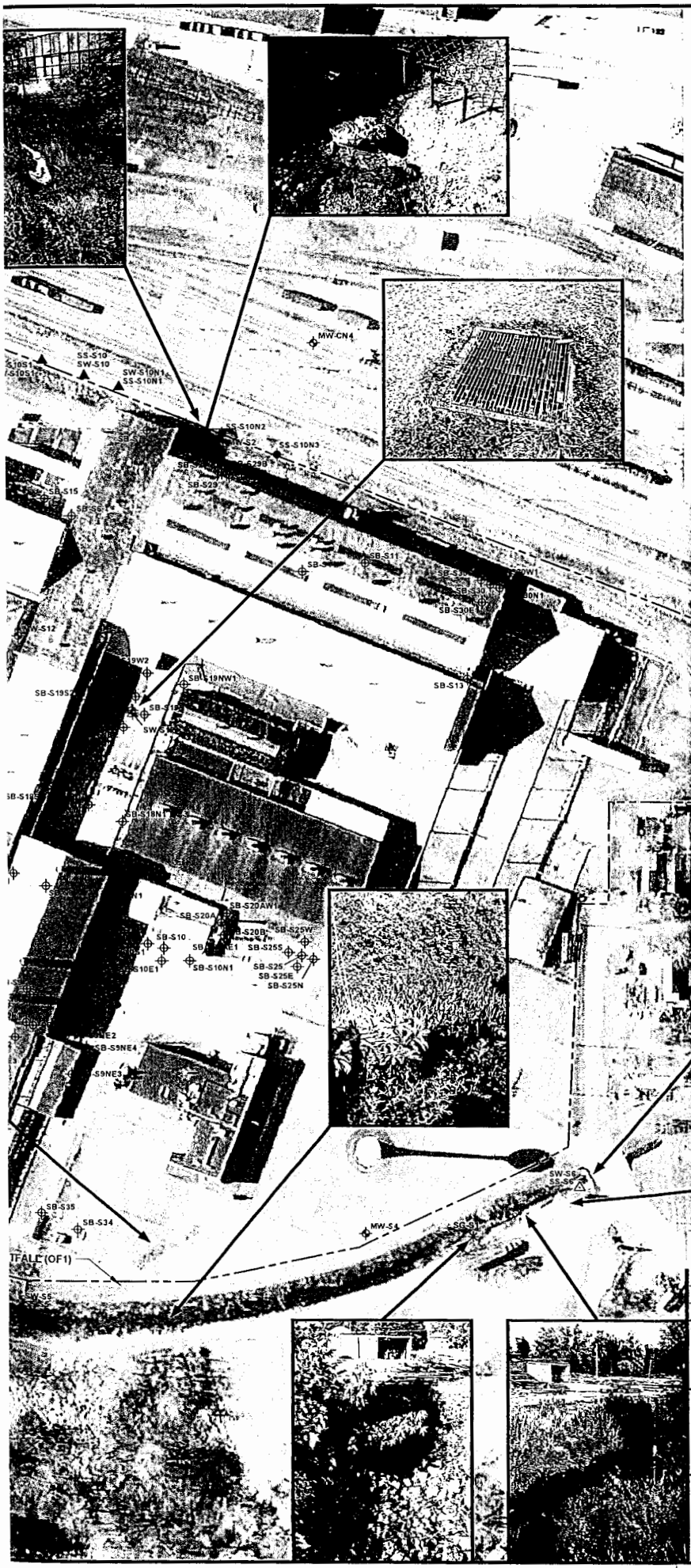


Location:		Consensus-Based Sediment Quality Guidelines		SS-S1			
Start Depth:				0			
End Depth:				0.1			
Date Sampled:				12/19/2007			
Sample Type Code:				N			
Parameter	Units	Region III FW BTAG	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	Result	Qual	RDL
SVOCs							
Acenaphthene	mg/kg	0.0067	0.0572	0.845	0.053	J	0.015
Acenaphthylene	mg/kg	0.0059			0.055	J	0.016
Anthracene	mg/kg	0.0572			0.23	J	0.016
Benzo[a]anthracene	mg/kg	0.108	0.108	1.05	0.52	J	0.011
Benzo[a]pyrene	mg/kg	0.15	0.15	1.45	0.6	J	0.0086
Benzo[g,h,i]perylene	mg/kg	0.17			0.41	J	0.0095
Benzo[k]fluoranthene	mg/kg	0.24			0.28	J	0.009
Chrysene	mg/kg	0.166	0.166	1.29	0.45	J	0.011
Fluoranthene	mg/kg	0.423	0.423	2.23	1.1	J	0.018
Fluorene	mg/kg	0.0774	0.0774	0.536	0.14	J	0.014
Indeno[1,2,3-cd]pyrene	mg/kg	0.017			0.34	J	0.0099
2-Methylnaphthalene	mg/kg	0.0202			0.028	J	0.015
Phenanthrene	mg/kg	0.204	0.204	1.17	0.7	J	0.013
Pyrene	mg/kg	0.195	0.195	1.52	0.9	J	0.017
Metals							
Lead	mg/kg	35.8	35.8	128	40.6	J	0.0057
Cyanide	mg/kg	0.1			0.16	J	0.16
Total Organic Carbon	mg/kg	N.S.			11600		113

Location:		Consensus-Based Sediment Quality Guidelines		SS-S4			
Start Depth:				0			
End Depth:				0.1			
Date Sampled:				12/19/2007			
Sample Type Code:				N			
Parameter	Units	Region III FW BTAG	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	Result	Qual	RDL
SVOCs							
Acenaphthene	mg/kg	0.0067	0.0572	0.845	0.068	J	0.036
Acenaphthylene	mg/kg	0.0059			0.14	J	0.041
Anthracene	mg/kg	0.0572			0.4	J	0.04
Benzo[a]anthracene	mg/kg	0.108	0.108	1.05	0.82	J	0.028
Benzo[a]pyrene	mg/kg	0.15	0.15	1.45	0.76	J	0.021
Benzo[g,h,i]perylene	mg/kg	0.17			0.65	J	0.024
Benzo[k]fluoranthene	mg/kg	0.24			0.56	J	0.022
Chrysene	mg/kg	0.166	0.166	1.29	0.82	J	0.028
Fluoranthene	mg/kg	0.423	0.423	2.23	1.7	J	0.045
Fluorene	mg/kg	0.0774	0.0774	0.536	0.28	J	0.034
Indeno[1,2,3-cd]pyrene	mg/kg	0.017			0.53	J	0.025
Phenanthrene	mg/kg	0.204	0.204	1.17	1	J	0.033
Pyrene	mg/kg	0.195	0.195	1.52	1.5	J	0.043
Metals							
Lead	mg/kg	35.8	35.8	128	52.3	J	0.0072
Manganese	mg/kg	460			519		0.031
Total Organic Carbon	mg/kg	N.S.			33400		141

Location:		Consensus-Based Sediment Quality Guidelines		SS-S2			
Start Depth:				0			
End Depth:				0.1			
Date Sampled:				12/19/2007			
Sample Type Code:				N			
Parameter	Units	Region III FW BTAG	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	Result	Qual	RDL
SVOCs							
Anthracene	mg/kg	0.0572			0.33	J	0.054
Benzo[a]anthracene	mg/kg	0.108	0.108	1.05	0.49	J	0.038
Benzo[a]pyrene	mg/kg	0.15	0.15	1.45	0.43	J	0.03
Benzo[g,h,i]perylene	mg/kg	0.17			0.38	J	0.033
Chrysene	mg/kg	0.166	0.166	1.29	0.46	J	0.038
Dibenzo[a,h]anthracene	mg/kg	0.033	0.033		0.18	J	0.061
Fluoranthene	mg/kg	0.423	0.423	2.23	0.83	J	0.062
Fluorene	mg/kg	0.0774	0.0774	0.536	0.29	J	0.045
Indeno[1,2,3-cd]pyrene	mg/kg	0.017			0.34	J	0.034
Phenanthrene	mg/kg	0.204	0.204	1.17	0.39	J	0.046
Pyrene	mg/kg	0.195	0.195	1.52	0.68	J	0.059
Total PAHs			1.61	22.8	3.57		
Metals							
Cyanide	mg/kg	0.1			0.24	J	0.14
Total Organic Carbon	mg/kg	N.S.			11000		96.8

Location:		Consensus-Based Sediment Quality Guidelines		SS-S3			
Start Depth:				0			
End Depth:				0.1			
Date Sampled:				12/19/2007			
Sample Type Code:				N			
Parameter	Units	Region III FW BTAG	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	Result	Qual	RDL
SVOCs							
Anthracene	mg/kg	0.0572			1.2	J	0.25
Benzo[a]anthracene	mg/kg	0.108	0.108	1.05	1.3	J	0.18
Benzo[a]pyrene	mg/kg	0.15	0.15	1.45	1.3	J	0.14
Benzo[g,h,i]perylene	mg/kg	0.17			1.7	J	0.15
Benzo[k]fluoranthene	mg/kg	0.24			0.45	J	0.14
Bis(2-ethylhexyl) Phthl	mg/kg	0.18			1.2	J	0.34
Chrysene	mg/kg	0.166	0.166	1.29	1.3	J	0.18
Fluoranthene	mg/kg	0.423	0.423	2.23	1.8	J	0.29
Indeno[1,2,3-cd]pyrene	mg/kg	0.017			1.2	J	0.16
Phenanthrene	mg/kg	0.204	0.204	1.17	0.72	J	0.22
Pyrene	mg/kg	0.195	0.195	1.52	2	J	0.27
Pesticides							
Dieldrin	mg/kg	0.0019	0.0019	0.0618	0.0065	J	0.0017
gamma-Chlordane	mg/kg	0.00324	0.00324	0.0176	0.019	J	0.0023
PCBs							
Aroclor 1254	mg/kg	0.0598	0.0598	0.676	0.074	J	0.0065
Metals							
Arsenic	mg/kg	9.8	9.79	33	10	L	0.045
Cadmium	mg/kg	0.99	0.99	4.98	1.1		0.025
Copper	mg/kg	31.6	31.6	149	48.6	L	0.023
Iron	mg/kg	20000			28800		0.79
Lead	mg/kg	35.8	35.8	128	144	J	0.0093
Nickel	mg/kg	22.7	22.7	48.6	26		0.019
Zinc	mg/kg	121	121	459	398	L	0.032
Cyanide	mg/kg	0.1			1.2	J	0.26
Total Organic Carbon	mg/kg	N.S.			50200		183



LEGEND

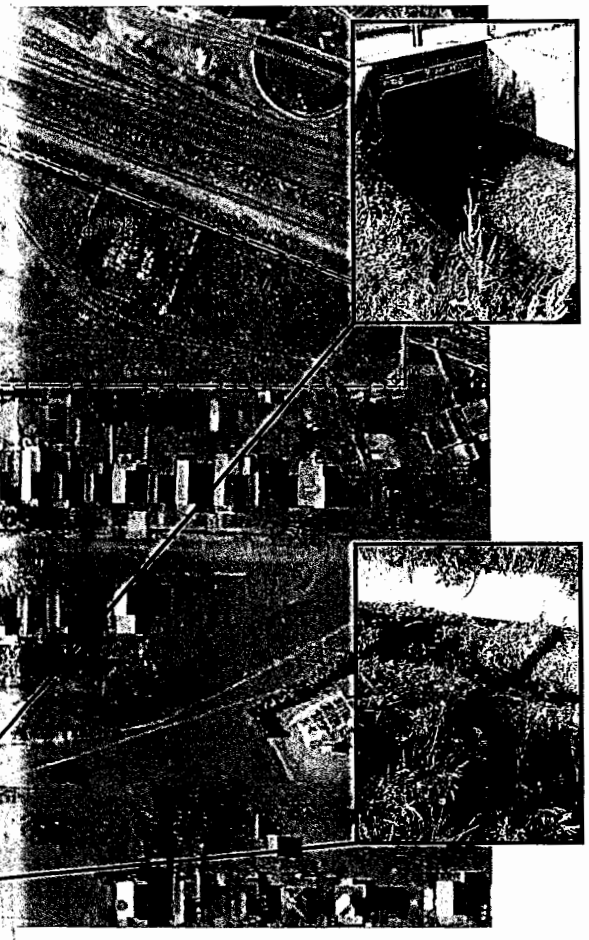
- PROPERTY LINE
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER (SW) AND SEDIMENT SAMPLE (SS) SAMPLE LOCATION
- SURFACE WATER (SW) AND SURFACE SOIL (SS) SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- STAFF GAUGE

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BAIRD, INC, DATED AUGUST 25, 2011.

3.) AERIAL ORTHOPHOTO TILES, DATED 2005, FROM THE PENNSYLVANIA SPATIAL DATA ACCESS WEBSITE AT http://www.pasda.psu.edu.



80 0 80 160
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

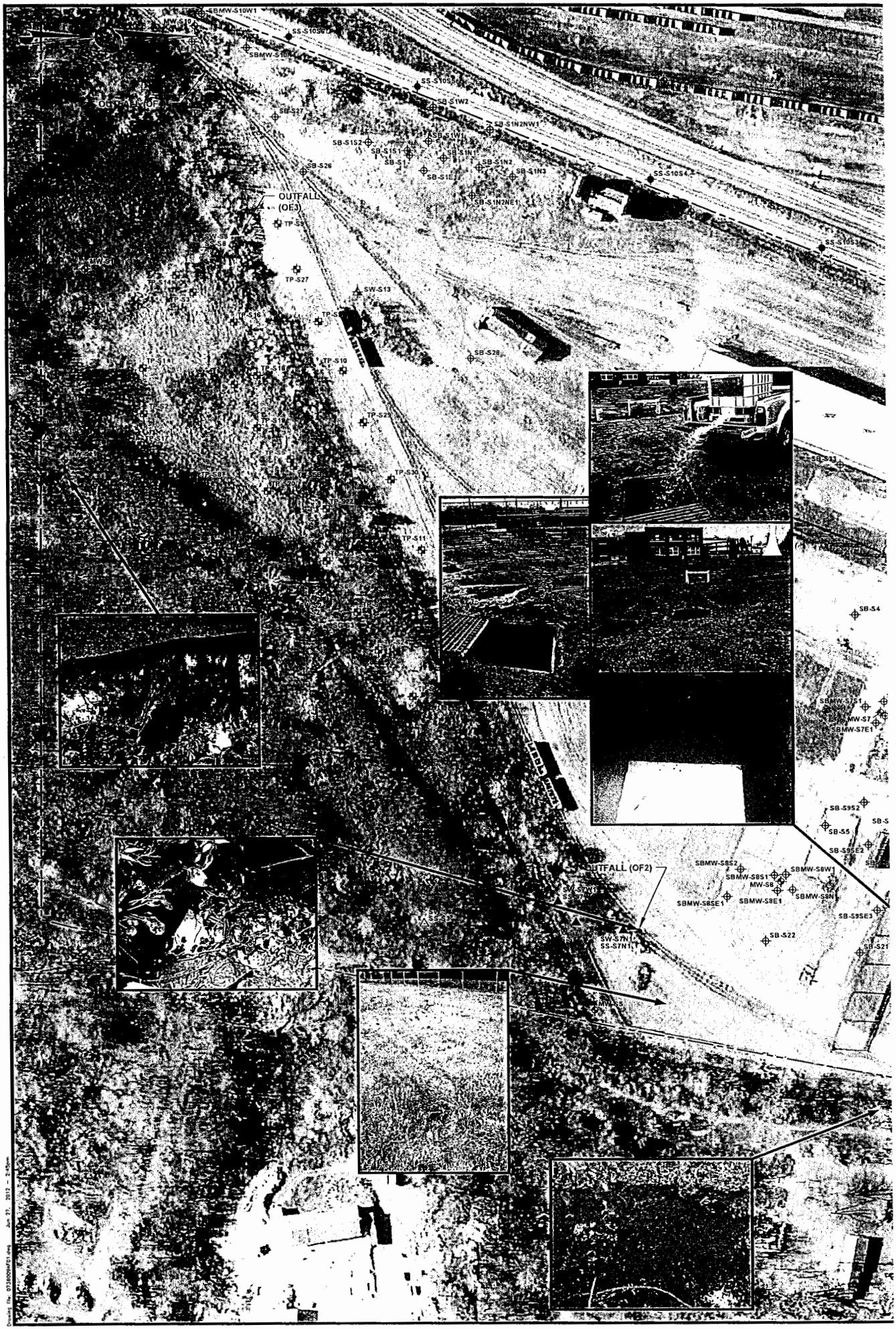
PROJECT
CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

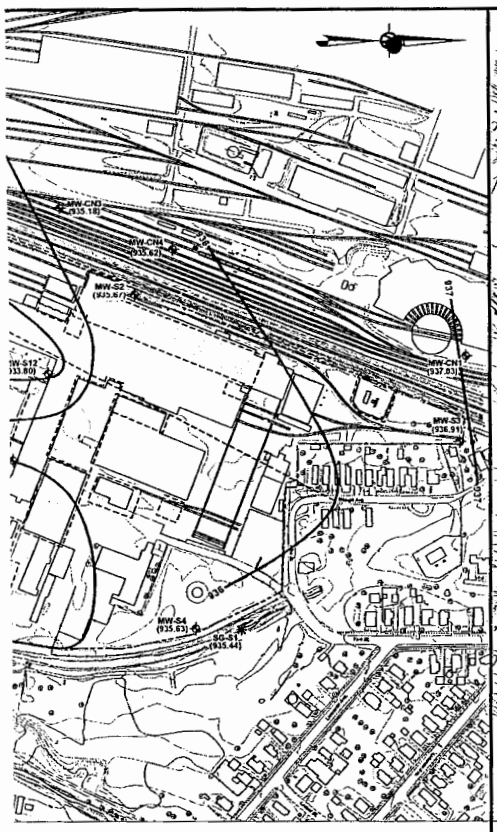
TITLE
SITE DRAINAGE FEATURES AND DYE STUDIES

NJ Authorization #24GA28029100
Golder Associates
Philadelphia USA

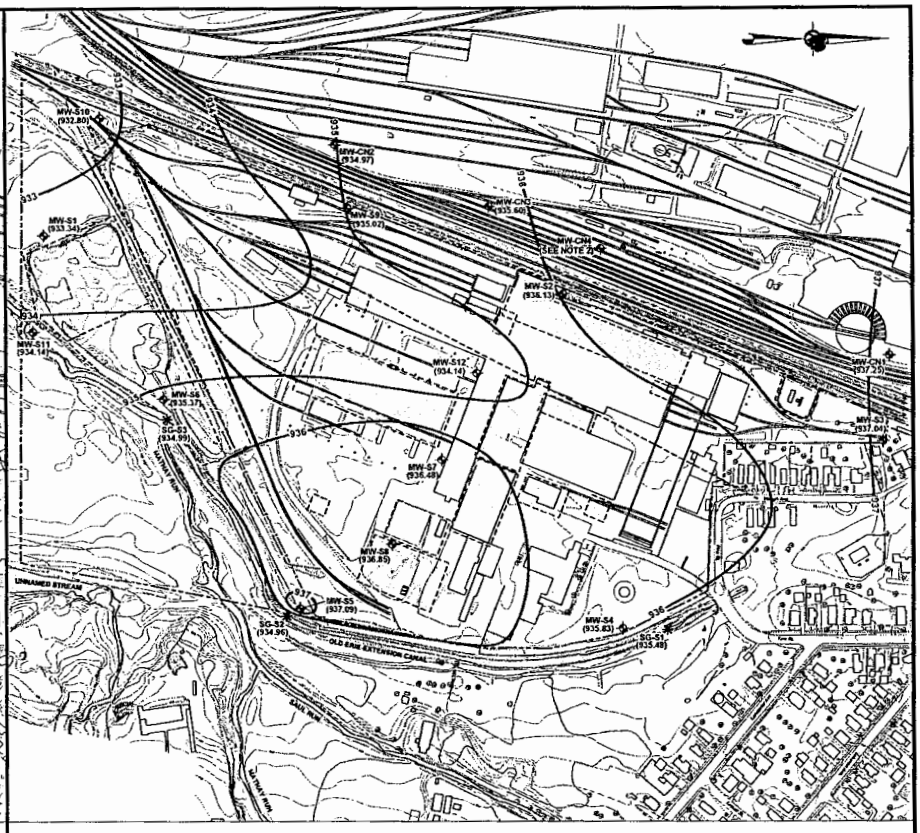
PROJECT No.		073-6009	FILE No.	0736009AF01
DESIGN	JBG	06/27/12	SCALE AS SHOWN	REV. 0
CADD	RG	06/27/12		
CHECK	JBG	06/27/12		
REVIEW	MAH	06/27/12		

FIGURE 4

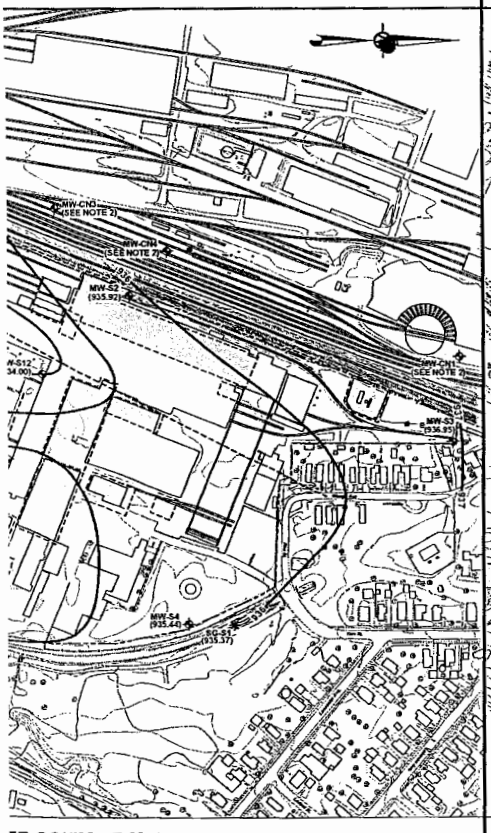

SBMW-S10W1
SS-S10S3
SBMW-S10E1
SS-S10S2
SB-S1W2
SB-S1N2NW1
SB-S1W1
SB-S1S2
SB-S1S1
SB-S1N1
SB-S1
SB-S1N2
SB-S1N3
SB-S1E1
SB-S1N2NE1
SS-S10S4
SS-S10S1
SB-S26
OUTFALL (OE3)
TP-S9
TP-S27
SW-S13
TP-S16
TP-S10
SB-S28
TP-S25
TP-S30
TP-S11
SB-S13
SB-S4
SB-S952
SB-S5
SB-S9SE2
SBMW-S8S2
SBMW-S8S1
SBMW-S8W1
MW-S8
SBMW-S8SE1
SBMW-S8E1
SBMW-S8N1
SB-S9SE3
OUTFALL (OF2)
SW-S7N1
SS-S7N1
SB-S22
SB-S21
MW-S5
SBMW-S7E1



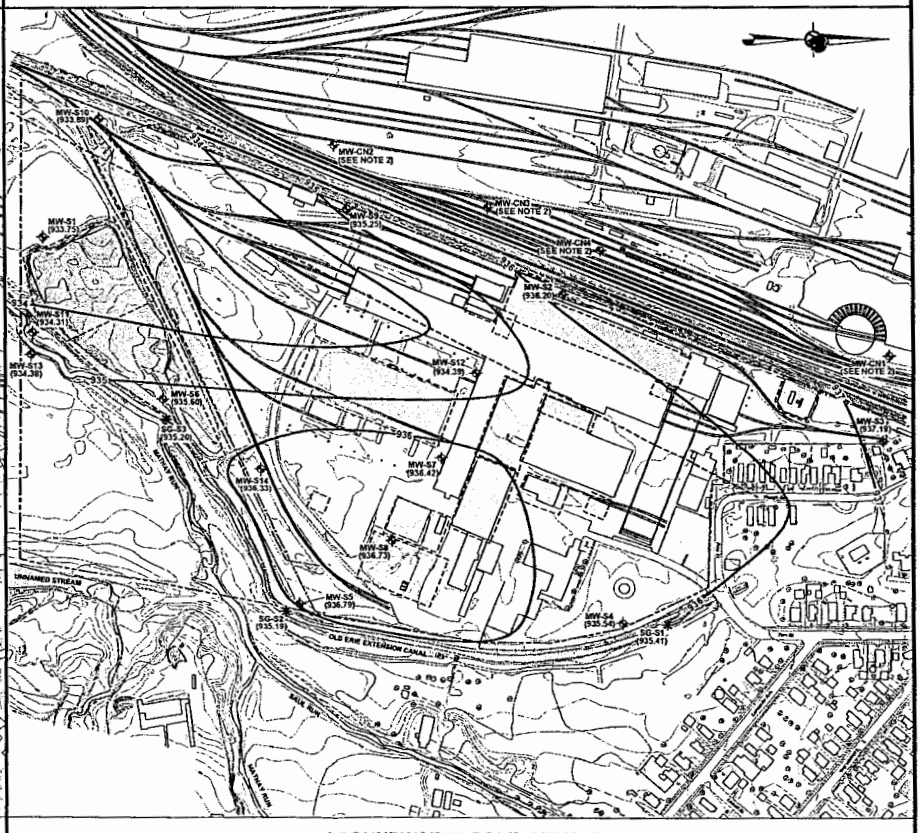
ER CONTOUR MAP
AY 2009



GROUNDWATER CONTOUR MAP
JUNE 2009



ER CONTOUR MAP
MBER 2011



GROUNDWATER CONTOUR MAP
DECEMBER 2011

RE, NO WATER LEVEL MEASUREMENTS FROM

2009. THEREFORE, NO WATER LEVEL
S AND MW-CN4 EXISTING WELLS LOCATED ON
: LEVEL MEASUREMENT EVENT.

08. THEREFORE, NO WATER LEVEL

E REVISIONS TO THOSE MAPS SUBMITTED IN
2008.

MW-CN3 IN SEPTEMBER 2011.

REFERENCES

1.) BASE MAP FROM DIGITAL CAD FILE 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC.," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009).

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-88 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

160 0 160 320
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	PM

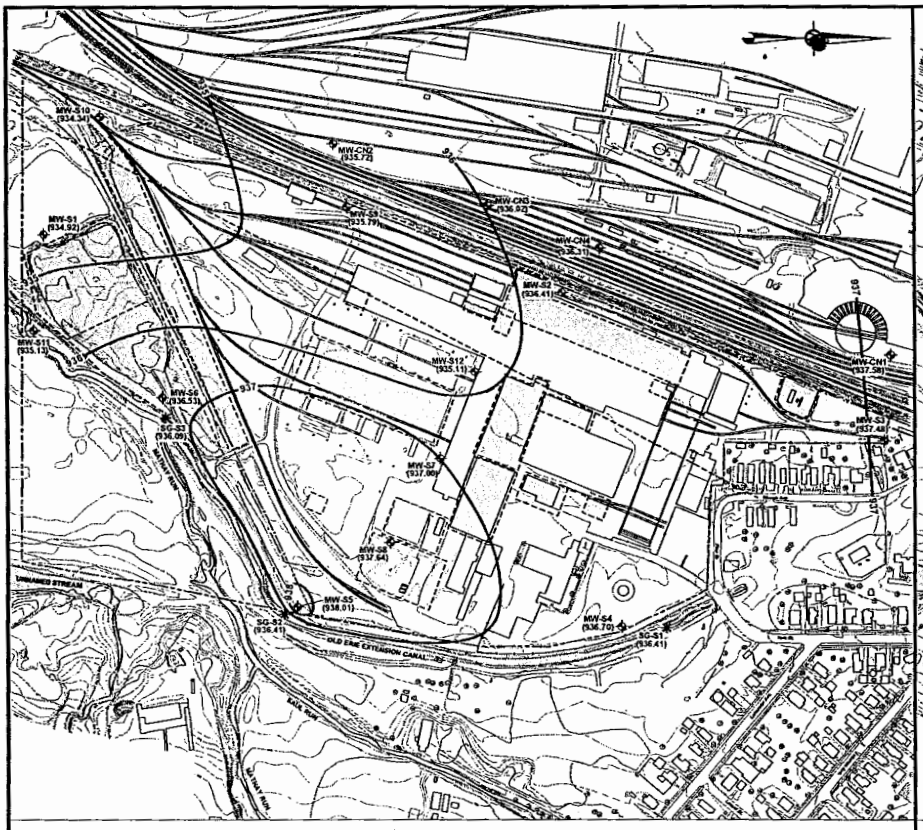
PROJECT
CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE
GROUNDWATER CONTOUR MAPS
2009 AND 2011

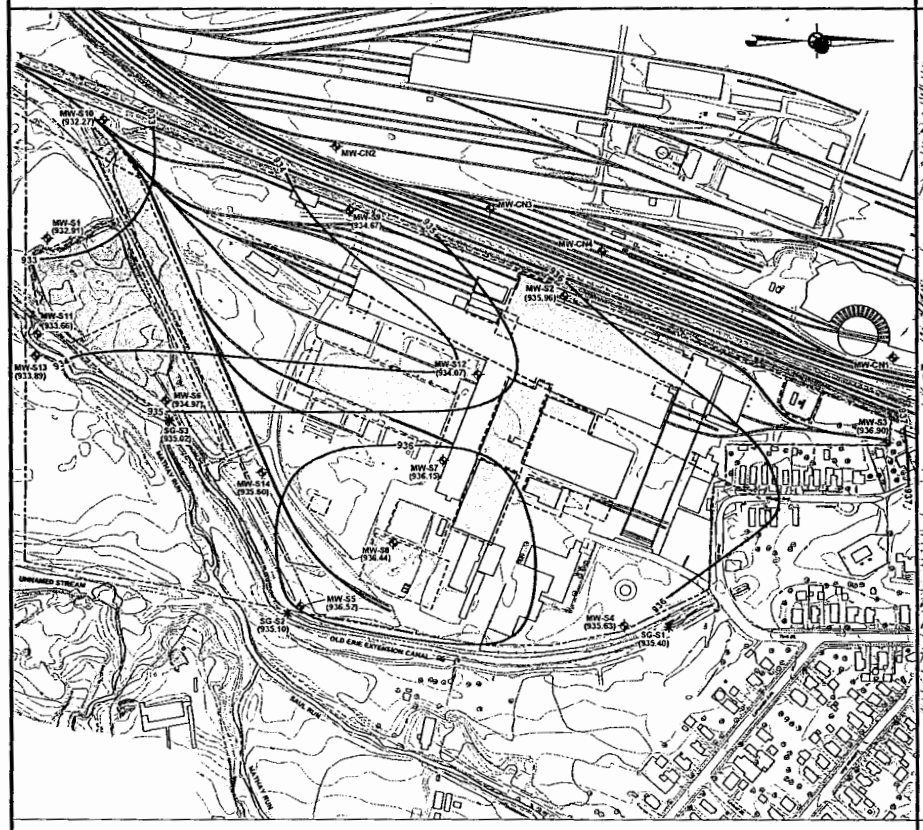
Golder Associates
Philadelphia USA

PROJECT No.	073-8009		FILE No.	0736009AF06	
DESIGN	RSA	06/27/12	SCALE	AS SHOWN	REV. 0
CADD	RG	06/27/12			
CHECK	YW	06/27/12			
REVIEW	JBS	06/27/12			

FIGURE 5



GROUNDWATER CONTOUR MAP
MARCH 2009



GROUNDWATER CONTOUR MAP
SEPTEMBER 2011

LEGEND

- PROPERTY LINE
- GROUNDWATER MONITORING WELL LOCATION
- STAFF GAUGE
- POTENTIAL AREA OF CONCERN (AOC) BOUNDARY
- STREAM OR CANAL
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- 24-INCH STORM SEWER
- 935 GROUNDWATER CONTOUR
- (933.19) GROUNDWATER ELEVATION

NOTES

1.) MW-S10, MW-S11, AND MW-S12 INSTALLED IN FEBRUARY 2
THESE WELLS IN APRIL AND SEPTEMBER 2008.

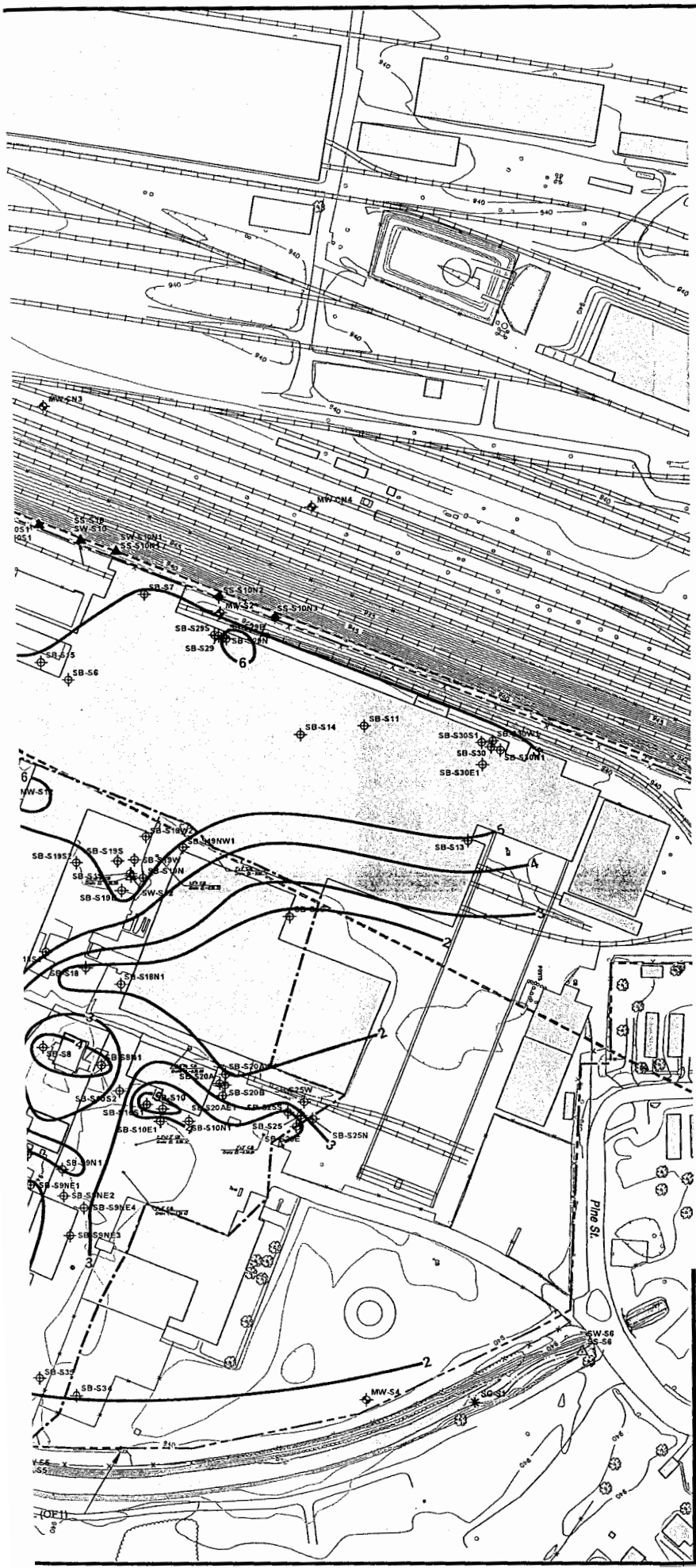
2.) MW-CN1 AND MW-CN2 INSTALLED ON ADJACENT PROPERTY
MEASUREMENTS FROM THESE WELLS IN APRIL AND SEPTEMBER 2
ADJACENT PROPERTY. MW-CN4 DECOMMISSIONED PRIOR TO JUNE

3.) STAFF GAUGES SG-S1, SG-S2, AND SG-S3 INSTALLED IN SE
MEASUREMENTS WERE AVAILABLE.

4.) THE GROUNDWATER CONTOUR MAPS FROM APRIL 2008 TO JU
THE REVISED SUPPLEMENTAL INVESTIGATION WORK PLAN DATED C

5.) MW-S13 AND MW-S14 INSTALLED IN AUGUST 2011.

6.) ACCESS NOT AVAILABLE FOR MONITORING WELLS MW-CN1, M



LEGEND

- PROPERTY LINE
- RAILS
- 940 — CONTOUR LINE
- DRAINAGE DITCH WITH INTERMITTENT FLOW
- BOROUGH 24-INCH STORM SEWER
- SURVEY BOUNDARY (SEE REFERENCE 1)
- SURFACE WATER SAMPLE LOCATION
- SURFACE WATER (SW) AND SEDIMENT SAMPLE (SS) SAMPLE LOCATION
- SURFACE WATER (SW) AND SURFACE SOIL (SS) SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION FROM DRAINAGE DITCH
- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING LOCATION
- TEST PIT LOCATION
- STAFF GAUGE
- BUILDING OR SLAB
- STREAM OR CREEK
- 5 — FILL THICKNESS CONTOUR

REFERENCES

1.) BASE MAP COMPILED FROM DIGITAL CAD FILES 08-3820 GOLDER-N-S.dwg, TITLED "TOPOGRAPHIC SURVEY OF TRINITY INDUSTRIES, INC," PROVIDED BY HOWELLS & BAIRD, INC, DATED JUNE 25, 2008 (REVISED JULY 15, 2009) AND 11-4417 A.dwg AND 11-4417 B.dwg, TITLED "TOPOGRAPHIC SURVEY FOR TRINITY INDUSTRIES, INC - SOUTH PLANT," PROVIDED BY HOWELLS & BAIRD, INC, DATED JULY 2011.

2.) THE HORIZONTAL COORDINATES SHOWN HEREON ARE REFERENCED TO PENN DOT MONUMENTS AO-86 AND AO-85 (PENNSYLVANIA STATE PLANE COORDINATE SYSTEM - NAD83)

3.) LOCATION OF BOROUGH 24-INCH STORM SEWER FROM CHICAGO BRIDGE AND IRON COMPANY DRAWING TITLED "FLOOD CONTROL PLAN IN VICINITY OF C.B & I CO. PLANT," DATED APRIL 22, 1974.

4.) PRE-DESIGN INVESTIGATION LOCATIONS WERE TAKEN FROM DIGITAL CAD FILE "08-3820 GOLDER-N-S 9-1-11.dwg," PROVIDED BY HOWELLS & BAIRD, INC, DATED AUGUST 25, 2011.

80 0 80 160
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

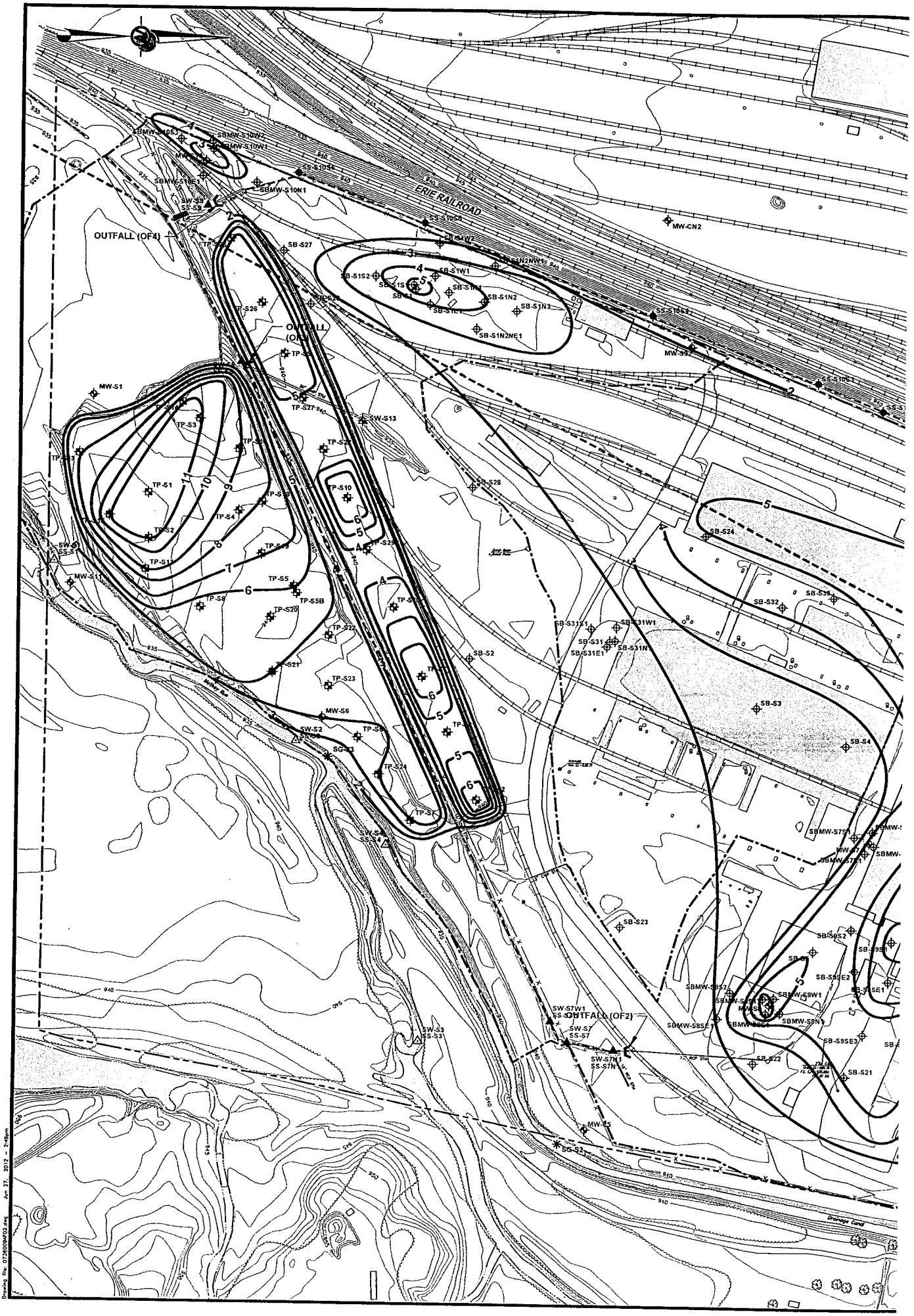
PROJECT
CLEANUP PLAN RESPONSE TO COMMENTS - SOUTH PLANT
TRINITY INDUSTRIES, INC.
GREENVILLE, PA

TITLE
FILL THICKNESSES

NJ Authorization #24GA28029100
Golder Associates
Philadelphia USA

PROJECT No.		073-6009	FILE No.		0736009AF02
DESIGN	VEF	06/27/12	SCALE	AS SHOWN	REV. D
CADD	RG	06/27/12			
CHECK	VEF	06/27/12			
REVIEW	JBG	06/27/12			

FIGURE 1A


ERIE RAILROAD
OUTFALL (OF4)
OUTFALL (OF2)
MW-S1
MW-S6
MW-CN2
SW-S1
SS-S1
SW-S2
SS-S2
SW-S3
SS-S3
SW-S4
SS-S4
SW-S7
SS-S7
SW-S7W1
SS-S7W1
SW-S7N1
SS-S7N1
SW-S9
SS-S9
SW-S13
SG-S1
SG-S2
SG-S3
MW-S5
Drainage Canal
Drawing file: 0736090403.dwg Jun 17, 2012 - 7:46am

APPENDIX A-4

NOVEMBER 27, 2012 PADEP LETTER

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHWEST REGIONAL OFFICE

NOV 27 2012

CERTIFIED MAIL NO. 7011 3500 0000 8608 1437

Terry Barrett, P.G.
Remediation Projects Manager
Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Re: Conference Call Summary for South Plant Cleanup Plan
October 18, 2012
Trinity Industries, Inc.
Facility ID No. 731732
Borough of Greenville, Mercer County

Dear Mr. Barrett:

Representatives of the Pennsylvania Department of Environmental Protection (Department) and Trinity Industries, Inc. (Trinity) participated in a conference call on October 18, 2012. The purpose of the conference call was to discuss Trinity's proposed responses to the Department's April 27, 2012, Cleanup Plan disapproval letter received by the Department on July 3, 2012, (attached). This letter summarizes the conference call and additional measures required to resolve remaining concerns.

The following bulleted list parallels the headings used in Trinity's July 3, 2012, letter to the Department. The Department's position regarding each issue is presented:

- PADEP Comment 1: The Department is satisfied with the proposed response.
- PADEP Comment 2: In general, the Department agrees with Trinity's proposed response, with the provision that Trinity is able to demonstrate attainment for groundwater under the Act 2 Background Standard. In addition, Trinity should show that the site fill material is not posing a threatened release to groundwater. Trinity was also informed of their option to perform a Site-Specific Risk Assessment for manganese in soil.
- PADEP Comment 3: The Department is satisfied with the proposed response.
- PADEP Comment 4: The Department is satisfied with the proposed response.
- PADEP Comment 5: The Department is satisfied with the proposed response.

- PADEP Comments 6 and 7: The discussion did not resolve the issue concerning contaminated sediments in the Erie Extension Canal and their relationship to releases at the site. Specifically, the Department did not agree that Trinity had adequately investigated the storm water conveyance system with respect to points of discharge into the Erie Extension Canal and Mathay Run. The Department agreed to perform a field inspection (completed on October 19, 2012) to investigate the existence of outfalls associated with the National Pollution Discharge Elimination System (NPDES) Permit No. PAR808323 approved for discharges to the Erie Extension Canal.

- PADEP Comment 8: The Department is satisfied with the proposed response.

- PADEP Comment 9: The Department is satisfied with the proposed response.

- PADEP Comment 10: The Department is satisfied with the proposed response.

Storm Water Conveyance System and Ecological Screening Assessment

The Department's October 19, 2012, field inspection did not confirm the existence of surface water outfalls from the storm water conveyance system (SCS). However, Trinity's position that there are no outfalls to the Erie Extension Canal or Mathay Run from the SCS is in contradiction to the approved Remedial Investigation Report for this site which showed mapped storm water outfalls to these streams. Adequate characterization of the SCS is needed to support a complete Site-Specific ecological screening assessment for this site. While Trinity has performed investigation of the SCS through dye testing and geophysical techniques, none of these measures has succeeded in showing the discharge location for storm water at this site. This was confirmed by the Department's telephone conversation with your consultant, Joseph Gormley, P.E., of Golder Associates, Inc. on November 20, 2012.

The Department requests Trinity further characterize the SCS and determine the current and historic discharge point(s) of the storm water conveyance system. The results of the investigation should be submitted to the Department by December 18, 2012. The Department will discuss revisions, if any, to the agreed January 2013 submission timeline for the revised Cleanup Plan after reviewing the results of the complete SCS investigation, which characterizes both historic and current discharge locations for the SCS.

Sincerely,

John W. O'Hara, P.G.
Section Chief
Environmental Cleanup and Brownfields Program

cc: Grant Dufficy (USEPA)
Joseph Gormley, Jr., P.E.
Kristie Shimko - DEP
Doug Moorhead - OCC
Kim Bontrager - DEP
File

JOH:lsl

APPENDIX A-5

DECEMBER 21, 2012 TRINITY/GOLDER LETTER

Golder Associates

December 21, 2012 Project No. 073-6009-100

John W. O'Hara, P.G.
Section Chief
Environmental Cleanup and Brownfields Program
Pennsylvania Department of Environmental Protection
230 Chestnut Street
Meadville, PA 16335

RE: DECEMBER 18, 2012 MEETING REGARDING SOUTH PLANT CLEANUP PLAN TRINITY INDUSTRIES, INC. FACILITY ID NO. 731732 GREENVILLE, MERCER COUNTY, PENNSYLVANIA

Dear Mr. O'Hara:

Thank you for meeting with Trinity Industries, Inc. (Trinity) and Golder Associates Inc. (Golder) to discuss the results of our recent storm sewer investigations at the Trinity South Plant Site (Site) located at 100 York Street in Greenville, Pennsylvania. The purpose of this letter is to provide a brief summary of the investigative work performed, confirm our agreements during the meeting, and present an updated schedule for submitting a Revised Cleanup Plan for the Site.

On behalf of Trinity, Golder performed additional storm sewer investigations at the Site to characterize the stormwater conveyance system and confirm the current and historic discharge point(s) of the system. These phased investigations were performed in response to requests by the Pennsylvania Department of Environmental Protection (PADEP) including a verbal request during a November 8, 2012 telephone call with Trinity and a subsequent letter to Trinity dated November 27, 2012. Work performed at the Site included the following:

- Geophysics survey on November 13, 2012
- Sewer camera survey on November 20, 2012
- Test Pitting on December 12, 2012

As we discussed at the December 18, 2012 meeting, the phased investigations confirmed that there are no direct stormwater discharges from the Site to either the Old Erie Canal or to Mathay Run. In addition, the investigations confirmed that the previously permitted stormwater outfalls (OF-1, OF-2, and OF-3) actually discharge to on-Site stormwater drainage ditches that were fully characterized during the previous Remedial Investigation for the Site.

During the meeting, PADEP acknowledged that Golder's additional investigations satisfactorily demonstrated there are no direct stormwater discharges from the Site and noted that a PADEP Biologist had previously determined that the Site drainage ditches are not waters of the Commonwealth of Pennsylvania. Therefore, no further investigations or Ecological Risk Assessments are necessary to characterize the Site, and Trinity can proceed with revising the Cleanup Plan in accordance with comments provided by PADEP in an April 27, 2012 disapproval letter.

Going forward, Trinity intends to have the plan ready to go for public comment by January 21, 2013; however, the requisite public comment period will necessitate final delivery to PADEP on February 28, 2013. We have submitted an updated project schedule reflecting this timing for your approval

Golder Associates Inc.
200 Century Parkway, Suite C
Mt. Laurel, NJ 08054 USA
Tel: (856) 793-2005 Fax: (856) 793-2006 www.golder.com

(see attached). As discussed, the Revised Cleanup Plan will include the results of the additional stormwater investigations.

Trinity and Golder believe this letter accurately reflects the discussions held and agreements made during our December 18, 2012 meeting and serves as a sufficient record of such. If you have any questions or comments regarding the above, please do not hesitate to contact Terry Barrett, of Trinity, or Joe Gormley.

GOLDER ASSOCIATES INC.

Joseph B. Gormley, Jr., P.E.
Senior Consultant, Project Coordinator

Mark Haney
Project Director

cc: Terry Barrett, P.G., Trinity Industries, Inc. (Electronic Copy)
Grant Dufficy, USEPA
Eric Gustafson, DEP
Kristie Shimko, DEP
Clem DeLattre, DEP
Doug Moorhead, DEP
Kim Bontrager, DEP

Attachment Updated Schedule – South Plant Response Activities

JBG/MAH:bjb

Updated Schedule[1]
South Plant Response Activities
Trinity Industries, Inc. - Greenville, Pennsylvania

Activity	Duration	Start Date	End Date
Design Activities[1]			
Cleanup Plan			
Prepare Revised Cleanup Plan	Ongoing	----------	----------
Public Comment Period for Revised Cleanup Plan	30 days	1/21/2013	2/19/2013
Submit Revised Cleanup Plan and Responsiveness Summary to PADEP	0 days	Upon Completion of Cleanup Plan and Public Comment Period including Preparation of Responsiveness Summary	2/28/2013
PADEP Review/Approval	90 days	3/1/2013	5/29/2013
Site Response Activities[2]			
On-Site Response Actions			
Mobilization[3]	7 days	9/30/2013	10/6/2013
Site Cleanup[4]	To Be Determined	10/7/2013	To Be Determined
Final Report Activities			
Final Report			
Prepare Final Report	90 days	Upon Completion of the Site Cleanup and Post-Closure Monitoring	----------
Public Comment Period for Revised Cleanup Plan	30 days	Upon Completion of Final Report	----------
Submit Final Report and Responsiveness Summary to PADEP	0 days		Upon Completion of Final Report and Public Comment Period including Preparation of Responsiveness Summary
PADEP Approval	90 days		

Notes:
1. This updated schedule reflects Trinity's best current estimate of the duration for the Design, Permitting, Contracting, and Public Involvement Plan tasks as well as assumed PADEP review times. This schedule will be updated in the future to reflect any changes in these durations.
2. All subsequent dates are based on PADEP approval of the Revised Cleanup Plan.
3. Trinity expects approximately 120 days to prepare and secure all necessary permits, prepare bid documents, and select a remediation contractor. The mobilization date is currently planned to be during Fall 2013 and is contingent on regulatory approval of construction permits.
4. Duration of Site Cleanup Activities is dependent on many factors such as extent of excavation/ grading, quantities for off-site disposal, availability/location of offsite disposal facilities, weather, etc.

APPENDIX B

PRE-DESIGN INVESTIGATION RESULTS

APPENDIX B – PRE-DESIGN INVESTIGATION RESULTS

CLEANUP PLAN
SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

Prepared For: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

January 2012

Project No. 073-6009-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Tables

List of Figures

List of Attachments

1.0 INTRODUCTION AND BACKGROUND

On behalf of Trinity Industries, Inc. (Trinity), Golder Associates Inc. (Golder) has prepared this summary of the scope of work and findings of the pre-design investigations at the South Plant Site (Site). These field investigations were designed and completed consistent with recommendations presented in the *Cleanup Work Plan, South Plant Site* (CWP, Golder 2011), which was reviewed and approved with modifications by the Pennsylvania Department of Environmental Protection (PADEP) on June 7, 2011. The work was performed in accordance with requirements of both the Consent Order and Agreement (COA) executed by the Commonwealth of Pennsylvania on December 21, 2006 and the Land Recycling and Environmental Remediation Standards Act (Act 2).

On behalf of Trinity, Golder submitted the Revised Remedial Investigation (RI) Report, South Plant (RI Report, Golder 2010) for the Site on March 1, 2010. The RI Report presented the results of field investigations for Constituents of Concern (COCs) in soil, groundwater and Site stormwater drainage. The COCs included metals, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The RI work was conducted in general accordance with the *Final Revised Remedial Investigation Work Plan, North and South Plants* (RI Work Plan, Golder 2007).

Based on the findings presented in the RI Report, the Cleanup Work Plan was submitted to PADEP to propose Response Actions for soils, surface water and groundwater to address impacts at, and potentially migrating from, the Site. The following are field investigations recommended in the Cleanup Work Plan to support remedy evaluation, selection and design:

- Further characterization of soils for disposal or containment design consideration in impacted areas and former disposal areas
- Stormwater drainage evaluation
- Vapor intrusion evaluation at AOC-S2
- Additional groundwater investigations

2.0 SCOPE OF WORK

A field program was developed to address the above listed investigations and is described in the following subsections. Figure B-1 presents the locations for the additional field investigations. The field procedures were performed in general accordance with the RI Work Plan. Investigation-derived waste (IDW) was placed into 55-gallon steel drums with lids, labeled, and stored in a staging location on-Site for characterization and future disposal. The field locations were surveyed by Howells and Baird, Inc., a Pennsylvania-licensed surveyor.

2.1 Further Characterization of Soils

To support the remedial design effort, on-Site soil samples were collected and submitted to laboratories for both chemical analysis and geotechnical testing. The results will be used to further characterize the soils for management via on-Site containment or off-Site disposal options.

2.1.1 Chemical Analyses

Based on the range of metals concentrations found in soils during the RI, there was a potential that some soils could be characterized as hazardous based on toxicity characteristic leaching procedure (TCLP) testing. In accordance with Section 5.1 of the Cleanup Work Plan, Golder collected additional soil samples at selected Areas of Concern (AOCs, see Figure B-1 for locations). The samples were submitted to TestAmerica Laboratories, Inc. (TestAmerica), a Pennsylvania-certified laboratory, for the following analyses:

- RCRA metals, both total and TCLP
- Percent moisture, used to calculate total metals results
- Corrosivity (pH), only for samples collected in the former pickling area (AOC-S3) and former acid pond (AOC-S19)

The following specific Site areas and associated AOCs were selected for further chemical characterization of soils:

Former Disposal Areas

- AOC-S1 "Old Ballfield"
- AOC-S11 Debris/Fill Area Adjacent to AOC-S1
- AOC-S17 Sandblast Sand Fill Area

Former Operating Areas

- AOC-S3 Former Pickling Area
- AOC-S6A Boiler/Power House-East Side

- AOC-S19 Former Acid Filter Drainage Pond
- AOC-S21 Former Plate Painting Yard

Surface Water Pathway Areas

- AOC-S12 Western Drainage Ditch
- General Downgradient SW1
- General Downgradient SW2

A total of 33 soil boring locations were sampled during July 26 to 28, 2011. Table B-1 lists the location, depth, and analyses for each sample. The borehole depths for locations GAI-S1 thru GAI-S17 were based on the RI Report analytical results for metals. The borehole depths for the disposal area locations GAI-S18 thru GAI-S33 were based on the thickness of disposal fill material observed during the RI. The selected locations were spatially distributed across the inferred impacted areas. However, some locations were biased towards the RI locations that showed the highest metals results for each area.

The drilling work was performed by the Pennsylvania-licensed driller SJB Services, Inc. (SJB). Subsurface utility clearance was performed by SJB. With the exception of locations in AOC-S12, the borings were advanced using direct push drilling methods (e.g., Geoprobe® with Macro-Core® soil samplers) regardless of depth. When surficial concrete or asphalt was encountered, it was not included in the sample. Due to both access and the shallowness of the soil samples in AOC-S12, those locations were collected using hand tools. Observations of the boreholes, including depth and soil descriptions, were documented in field logs. These were converted to gINT® logs and are provided in Attachment A.

Composite samples from the borings were collected from the ground surface to the depths provided in Table B-1. The two surface soil samples in AOC-12 were composited from several locations in the vicinity of the indicated position to provide enough sample volume for the laboratory analyses. Upon completion of sampling activities, each boring was backfilled with the unused extruded soil.

During the sampling activities at GAI-S8, the soil was observed to have dark staining and a petroleum-like odor the length of the 18 foot deep boring. Maximum readings with a field photoionization detector were 313 parts per million (ppm). Consistent with these field observations (highest PID readings), a sample for analysis of volatile organic compounds (VOCs) was collected using EnCore® samplers from the 3- to 4-foot interval below ground surface (bgs).

Following collection, the soil samples were transported by courier to TestAmerica for the selected analyses. Quality control samples were collected and analyzed in accordance with the RI Work Plan.

2.1.2 Geotechnical Testing

To support the remedial design for the former waste disposal areas, various geotechnical characteristics are needed for the existing soils. Additional soil samples were collected concurrently with the above described samples (Section 2.1.1) and tested at the Golder soils laboratory in Atlanta, Georgia for the following geotechnical parameters:

- Geotechnical index tests to assist with classification of the Site soils, including:
- Grain size, ASTM D422
- Moisture content, ASTM D2216
- Standard Proctor, ASTM D698
- Direct shear testing for three points per sample, ASTM D2850

A total of eight soil samples were collected in individual 5-gallon buckets in each of the following Site areas:

- AOC-S1, from GAI-S31
- AOC-S3, from GAI-S8
- AOC-S11, from GAI-S26
- AOC-S17 (western side) , from GAI-S18
- AOC-S17 (eastern side) , from GAI-S21
- AOC-S21, from GAI-S2
- General Downgradient SW1, from GAI-S14
- General Downgradient SW2, from GAI-S17

2.2 Stormwater Drainage Evaluation

Golder conducted a stormwater drainage evaluation on July 29, 2011 to better understand some of the drainage and outfall discharge patterns at the Site. In accordance with the Cleanup Work Plan, Golder conducted visual inspections and dye tests. The following locations (refer to Figure B-1) were evaluated for the following reasons:

- DT-S1 (a stormwater drain in the former parking area to the east of the former Main Office) to observe if this area collects stormwater from the former operating areas around AOC-S3 and determine if it drains to the Old Erie Extension Canal
- DT-S2 (a stormwater drain in AOC-S21) to observe if stormwater from this area drains to the Western Drainage Ditch (AOC-S12)

Prior to field activities, Golder contacted the PADEP, Hempfield Township, and Greenville Borough authorities via telephone to inform them of the stormwater drainage evaluation.

Locations DT-S1 and DT-S2 were visually inspected to observe the direction the flow into and out of each stormwater drain. Prior to the dye tests, accumulated sediment was removed from the storm drains to facilitate drainage of the dyed water. This involved lifting and setting aside the grates covering the storm drains using appropriate tools and mechanical equipment. To the extent practical, the sediment was shoveled with hand tools and placed on the ground next to the drain.

Dye tests were then performed to attempt to observe which outfalls were connected to the storm drains. The dye tests used potable water obtained from the Site water supply. A portable intermediate bulk container (IBC) was used to transport water in approximately 300 gallon batches to the test location. A non toxic dye of the type typically used for investigating septic systems was mixed in the IBC. The following volumes of dyed water were poured into the storm drains:

- DT-S1 – 600 gallons of green-dyed water
- DT-S2 – 1,200 gallons of red-dyed water

As the dye batches were being poured into the storm drains, and for several hours after, known stormwater drainage features in the area were observed for dye. In addition to the Old Erie Extension Canal and Western Drainage Ditch, visual observations for dye were also made at a drainage pipe in AOC-S19, outfalls OF-2 and OF-4, the areas directly upgradient and downgradient of these outfalls, and Mathay Run at locations adjacent and downstream of the Site.

The results of the stormwater drainage evaluation are presented in Section 3.2.

2.3 Vapor Intrusion Evaluation

In accordance with the Cleanup Work Plan, Golder conducted a soil vapor evaluation in AOC-S2 (Former Paint Shop) to assess if vapor intrusion represents a potential unacceptable risk to future on-Site workers and to decide if further response actions are necessary. For this evaluation, Golder performed sub-slab sampling with SUMMA canisters on August 26, 2011. The scope of work was based on procedures detailed in the Land Recycling Program Technical Guidance Manual (PADEP, 2002) and the OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (USEPA, 2002).

This vapor intrusion evaluation was triggered by soil analytical results for SB-S29B previously collected in the interval from 0 to 2-feet bgs. The sample had ethylbenzene (47 mg/kg) and xylene (290 mg/kg) concentrations that exceeded the PADEP Bureau of Land Recycling and Waste Management's commercial vapor intrusion screening levels (VISLs) for soils (9.5 mg/kg and 77 mg/kg, respectively).

For this evaluation, Golder sampled three sub-slab soil vapor locations at the Former Paint Shop building in the vicinity of SB-S29B. The locations are presented on Figure B-1 and are based upon the following rationale:

- SVI-S1 was placed proximate to SB-S29B where xylene was detected above the VISL
- SVI-S2 was installed approximately 100 feet north of SVI-S1 because USEPA vapor intrusion guidance recommends investigation within 100 feet of the known exceedances to the VISL
- SVI-S3 was located approximately 100 feet north of SVI-S2 to provide data to conservatively confirm if there is a potential for vapor intrusion in the north section of the building, although soils data collected in this area do not exceed the VISL.

The soil vapor intrusion evaluation consisted of the following activities:

- Installation of temporary sub-slab sample ports through the concrete floor at the three locations described above.
- Collection of sub-slab soil gas samples in Summa canisters from the three sample ports plus a field duplicate for laboratory analyses. The sub-slab soil gas samples were collected over a period of eight hours.
- Coordination with TestAmerica for analyses of samples for VOCs using USEPA Method TO-15.

The results of the vapor intrusion evaluation are presented in Section 3.3.

2.4 Additional Groundwater Investigations

In accordance with the Cleanup Work Plan, Golder performed additional groundwater investigations to support the assertion in the RI Report that the Mathay Run acts as a hydraulic barrier. These investigations included the installation of two additional shallow groundwater monitoring wells in the vicinity of Mathay Run and the former disposal areas. The wells were installed on August 16 and 17, 2011 by SJB. The wells are screened across the water table and are located in the following areas (refer to Figure B-1):

- MW-S13, south side of Mathay Creek between wells MW-S6 and MW-S11
- MW-S14, hydraulically up-gradient of the disposal areas

During installation of these PVC wells, soil samples were collected for visual observation using a split-spoon sampler. Observations of the well installations, including construction details and soil descriptions, were documented in field logs. The logs were converted to electronic gINT® logs and are provided in Attachment A.

Well MW-S13 was installed on a wooded parcel of Site property across Mathay Run from the main property. Accessing this area with drilling equipment was extremely difficult because there are no roads,

access from adjacent properties would have required a legal agreement and extensive site clearing, and the creek banks are relatively steep in the area. Because of these access limitations, SJB hand-carried equipment across the creek and installed MW-S13 using a drive hammer mounted on a tripod with a motorized winch.

Well MW-S14 was installed using a Geoprobe® rig. The split-spoon was advanced using direct-push techniques. After reaching the bottom of the boring with the split-spoon, an auger was used to widen the borehole for installation of the PVC monitoring well.

After construction was completed, the wells were developed using a hand bailer to remove water until the purged water was relatively clear.

On September 22, 2011, in accordance with the Cleanup Work Plan, water levels were measured both in the Site well network, including the two new wells, and at the Site surface water staff gauges. At the time of these field measurements, access was not available to monitor the wells on the Canadian National Railway property to the west of the Site (i.e., MW-CN1, MW-CN2, and MW-CN3). However, due to their distance from the Mathay Run and considering the previous data from these wells, the omission of water level data from these wells should not impact the interpretation of groundwater flow in the vicinity of creek.

The Cleanup Work Plan calls for three additional rounds of water level measurements. These events will be scheduled and subsequently reported elsewhere.

The results of the additional groundwater investigations are presented in Section 3.4.

3.0 RESULTS AND DISCUSSION

3.1 Further Characterization of Soils

3.1.1 Chemical Analyses

Following receipt of the results for the chemical analyses, Golder validated the data in accordance with the RI Work Plan. The laboratory analytical reports are provided in Attachment B. The results were tabulated, as follows, and compared to the described criteria:

- Table B-2 – Total Metals compared to the Pennsylvania non-residential soil medium-specific concentrations (MSCs) for both direct contact and soil-to-groundwater for used aquifers with total dissolved solids (TDS) less than or equal to 2,500 mg/L
- Table B-3 – TCLP Metals compared to RCRA hazardous waste characterization levels
- Table B-4 – Corrosivity: RCRA hazardous waste characterization levels
- Table B-5 – VOCs compared to the non-residential soil MSCs for direct contact and soil-to-groundwater for used aquifers with TDS less than or equal to 2,500 mg/L

The following subsections discuss the chemical analyses.

3.1.1.1 RCRA Metals

Consistent with the RI, elevated total lead was observed in some of the soil samples (refer to Table B-2). As shown in Table B-3, 8 of 33 samples (24%) exceeded the 5.0 mg/l TCLP threshold for lead, while 25 of the 33 samples were less than the threshold, many of them considerably so (e.g., 0.012 mg/l). A further breakdown is shown below:

Location	Total Number of TCLP Samples	Number of TCLP Results > 5.0 mg/l for Lead
Former Operating Areas	12	4 (33%)
Former Drainage Areas	6	2 (33%)
Former Disposal Areas	17	2 (12%)

No other metals exceeded TCLP criteria. A statistical evaluation of the lead data did not demonstrate a strong correlation between TCLP results and those for total lead, confirming the limitations of using totals values as reliable predictors of the presence of TCLP exceedances.

During upcoming remedial activities, additional soil sampling/analysis will be performed to characterize the excavated soils as either RCRA hazardous or residual waste based upon levels of TCLP lead. On-Site waste management, including separation and subsequent off-Site disposal, will be needed for

materials that are shown to be above the TCLP toxicity threshold for lead. If feasible, on-Site stabilization may be used to reduce the quantity of soils exceeding the TCLP threshold. The remaining materials (i.e., those below the TCLP regulatory threshold) can then be managed as residual waste within on-Site containment areas consistent with the current Site remediation strategy.

3.1.1.2 Corrosivity

Samples for corrosivity (pH) analysis were collected from the following areas:

- Former Pickling Area (AOC-S3): GAI-S5, GAI-S6, GAI-S7, and GAI-S8
- Former Acid Pond (AOC-S19): GAI-S9, GAI-S10, and GAI-S11 (includes field duplicate analysis)

The former operational activities in these areas used acids that have been inferred to have previously leached into the subsurface. Therefore, samples were tested to assess if the acid remained and needed appropriate management during remedial activities. As shown in the results (Table B-4), none of the locations had acidic conditions. Conversely, GAI-S11 located in the southern portion of AOC-19 reported elevated pH (basic conditions); however these results, for both the primary and duplicate samples, were below the RCRA hazardous waste characteristic levels.

3.1.1.3 Soil VOCs

A sample from GAI-S8 (AOC-S3) was analyzed for VOCs since dark staining and a petroleum-like odor was observed. The results were elevated for several VOCs (see Table B-5). During the RI, elevated VOCs were also observed in this area. In accordance with the Cleanup Work Plan, soil remediation is planned in this area.

3.1.2 Geotechnical Testing

The laboratory results for the geotechnical testing are provided in Attachment C. The results have been summarized in Table B-6. These results will be used to evaluate the remedial options for the Site.

3.2 Stormwater Drainage Evaluation

Golder conducted the stormwater drainage evaluation on July 28-29, 2011. During various times during the day on July 28, it rained heavily. When the red dye was poured into stormwater drain DT-S2, the rain was significant. When the green dye was poured into stormwater drain DT-S1, there was no rain for several hours. Overnight after the dye tests, there were several downpours. According to the National Oceanic and Atmospheric Administration (NOAA), over a half inch of rain was recorded on July 28, 2011 at its weather station in Jamestown, PA, which is approximately eight miles from the Site (source: NOAA website). Despite the rain, the concentrations of dye used during the test were still expected to still be visible at the projected downstream locations.

During the drainage evaluation, dye was not seen entering the Old Erie Extension Canal, the Western Drainage Ditch or any of the other locations on-Site including targeted observation points OF-2, OF-4, and Mathay Run. On-Site observations during the dye tests also showed that the outlet pipe from DT-S1 drains to a manhole directly east of OF-1 that redirects the flow to the south and not to the towards the Old Erie Extension Canal.

Several historic Site figures and NPDES permit documents show an outfall named OF-1 located to the east of DT-S1. This outfall is depicted on Figure B-1. However, Golder performed a Site inspection in March 2011 when vegetation was not thick and did not find an outfall pipe in this area. Because there are no known records of the outfall being removed from this location, it is possible that OF-1 was errantly marked on historic records, with the error perpetuated on subsequent documents. Based on the field observations, outfall OF-1 is likely the observed manhole and stormwater from the Site operational areas does not discharge into the Old Erie Extension Canal.

During the dye test, stormwater from the roof drains on the western Site buildings was observed to drain into the Western Drainage Ditch. No other outfalls from the former Site operational areas were seen to drain into the Western Drainage Ditch. In addition, stormwater from the roof drains around the former South Yard was observed to drain into stormwater drain DT-S2 and water in DT-S2 appeared to drain directly into the ground.

Based on the lack of observed discharging dyed water, it cannot be conclusively determined where stormwater entering the tested stormwater drains (DT-S1 and DT-S2) leaves the Site. However, historic inferred groundwater contours (see Figure B-2) have shown mounding in the southeast of the Site.

3.3 Vapor Intrusion Evaluation

Following receipt of the results for the chemical analyses from the Summa canisters, Golder validated the soil gas data in accordance with the RI Work Plan. The laboratory analytical reports are provided in Attachment B. The results are summarized in Table B-7.

In accordance with PADEP's vapor intrusion guidance, the sub-slab soil gas results were compared to Non-Residential Soil Gas MSCs. The Soil Gas MSCs were calculated by taking the PADEP Non-Residential Indoor Air MSCs found on Table 3 of the vapor intrusion guidance and dividing them by a Transfer Factor (TF) from soil gas to indoor air of 0.01. This TF is referenced on page 53 of the vapor intrusion guidance and is considered a conservative approach.

The results of the vapor intrusion evaluation show that several VOCs were detected in soil gas samples; however, none were detected above their respective Soil Gas MSCs. Based on these investigation

results, there are no potential risks to workers from vapor intrusion into the building, and therefore, no further response actions are necessary.

3.4 Additional Groundwater Investigations

Table B-8 presents the water levels measured at the Site wells, including the two new wells, and surface water staff gauges. The table includes results from the September 2011 monitoring event and the five previous monitoring events conducted by Golder (back to April 2008). Table B-8 also provides the water level elevations that have been calculated using previously surveyed measuring points at each location.

Figure B-2 presents the inferred groundwater contours for the Site from the events shown in Table B-8. It should be noted that the contours from September 2011 monitoring event are consistent with other recent events. The water level data measured in the vicinity of the former disposal areas are consistent with the assertion that Mathay Run is a hydraulic barrier, preventing COCs from reaching areas on the other side of the creek.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based upon the results of the pre-design investigations:

- The TCLP results do indicate the potential for some materials to be hazardous due to the presence of lead above TCLP regulatory threshold at such time when the materials are excavated and managed on- and/or off-site. Therefore, additional soil sampling/analysis will be necessary to characterize the excavated soils as either RCRA hazardous or residual waste based upon levels of TCLP lead.
- On-Site waste management will require separation, management, and off-site disposal of any materials that sampling confirms to be above the TCLP threshold for lead. If feasible, on-Site stabilization may be used to reduce the quantity of soils exceeding the TCLP threshold. The remaining soils (i.e., those below the TCLP regulatory threshold) can then be managed as residual waste within on-Site containment areas consistent with the current Site remediation strategy.
- Corrosivity is not considered to be an issue for management and/or disposal of excavated soils.
- Elevated VOCs in specific areas within AOC-S3 may require additional management and/or disposal requirements during remediation.
- There is no evidence that Oufall OF1 is hydraulically connected to the Old Erie Canal; therefore, stormwater from the Former Operating Areas that drain to this location do not discharge to the Old Erie Extension Canal.
- Vapor intrusion evaluation results show that there are no potential risks to workers from vapor intrusion into the building, and therefore, no further response actions are necessary.
- The assertion in the RI Report that Mathay Run is a hydraulic barrier is consistent with the water level data measured in the vicinity of the former disposal areas.

TABLE B-1
SOIL BORING LOCATIONS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

AOC	Sample Location	Borehole Depth (ft bgs)	Analytical Parameters
AOC-S6A	GAI-S1	2	RCRA Metals
AOC-S21	GAI-S2	6	RCRA Metals
	GAI-S3	2	RCRA Metals
	GAI-S4	2	RCRA Metals
AOC-S3	GAI-S5	2	RCRA Metals plus Corrosivity
	GAI-S6	2	RCRA Metals plus Corrosivity
	GAI-S7	2	RCRA Metals plus Corrosivity
	GAI-S8	18	RCRA Metals plus Corrosivity
AOC-S19	GAI-S9	6	RCRA Metals plus Corrosivity
	GAI-S10	6	RCRA Metals plus Corrosivity
	GAI-S11	6	RCRA Metals plus Corrosivity
AOC-S12	GAI-S12	0.1	RCRA Metals
	GAI-S13	0.1	RCRA Metals
General Downgradient SW1	GAI-S14	3	RCRA Metals
	GAI-S15	2	RCRA Metals
General Downgradient SW2	GAI-S16	2	RCRA Metals
	GAI-S17	8	RCRA Metals
AOC-S17	GAI-S18	7	RCRA Metals
	GAI-S19	6	RCRA Metals
	GAI-S20	6	RCRA Metals
	GAI-S21	9	RCRA Metals
	GAI-S22	9	RCRA Metals
AOC-S11	GAI-S23	8	RCRA Metals
	GAI-S24	9	RCRA Metals
	GAI-S25	7	RCRA Metals
	GAI-S26	7	RCRA Metals
	GAI-S27	8	RCRA Metals
	GAI-S28	7	RCRA Metals
AOC-S1	GAI-S29	10	RCRA Metals
	GAI-S30	10	RCRA Metals
	GAI-S31	15	RCRA Metals
	GAI-S32	14	RCRA Metals
	GAI-S33	11	RCRA Metals

Notes:

ft bgs – feet below ground surface

TOTAL METALS RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. -GREENVILLE, PENNSYLVANIA

Sample Location:		PADEP MSCs Non-Residential						GAI-S1		GAI-S2		GAI-S3		GAI-S4		GAI-S5		GAI-S6		GAI-S7		GAI-S8		GAI-S9	
Sample Date:								7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/27/2011		7/27/2011	
Sample Type Code:								N		N		N		N		N		N		N		N		N	
Start Depth (feet):				Soil to Groundwater				0		0		0		0		0		0		0		0		0	
End Depth (feet):		Direct Contact Soil		Used Aquifer, TDS<=2500 mg/l				2		6		2		2		2		2		2		18		6	
Parameter	Unit	0-2 feet	2-15 feet	100 X GW MSC	Generic Value	Max	1/10 Generic	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/kg	53	190000	1	29	29	*2.9*	*16*	*K*	*12*	*K*	*24*	*K*	*25*	*K*	*7.7*	*K*	*7.7*	*K*	*3.9*	*K*	*9.7*		*16*	*L*
Barium	mg/kg	190000	190000	200	8200	8200	*820*	370	K	250	K	230	K	290	K	470	K	200	K	15	K	120		120	
Cadmium	mg/kg	1400	190000	0.5	38	38	*3.8*	0.67		0.68	J	1.3		1.4		0.8		0.51		0.12		0.91		1.3	
Chromium	mg/kg	190000	190000	10	190000	190000	19000	75	L	65	L	95	L	210	L	310	L	37		8.2	L	96	K	25	L
Lead	mg/kg	**1000**	190000	0.5	450	450	*45*	*960*		***3000***		***5900***		***7000***		***3300***		*440*	*L*	*77*		***3600***		*410*	
Selenium	mg/kg	14000	190000	5	26	26	*2.6*	1.8	L	1.3	L	1	L	1.4	L	2.5	L	1.6	L	0.2	L	0.54	J	0.97	J
Silver	mg/kg	14000	190000	10	84	84	8.4	0.13	J	1.4	U	0.089	J	0.13	J	0.1	J	0.058	J	0.026	J	0.05	J	1.1	U
Mercury	mg/kg	450	190000	0.2	10	10	*1*	0.51		0.21		0.33		0.35		0.33		0.51		0.014	J	0.032	K	0.73	

Sample Location:		PADEP MSCs Non-Residential						GAI-S10		GAI-S11		GAI-S11		GAI-S12		GAI-S13		GAI-S14		GAI-S15		GAI-S16		GAI-S17	
Sample Date:								7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011	
Sample Type Code:								N		N		FD		N		N		N		N		N		N	
Start Depth (feet):				Soil to Groundwater				0		0		0		0		0		0		0		0		0	
End Depth (feet):		Direct Contact Soil		Used Aquifer, TDS<=2500 mg/l				6		6		6		1		1		3		2		2		8	
Parameter	Unit	0-2 feet	2-15 feet	100 X GW MSC	Generic Value	Max	1/10 Generic	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/kg	53	190000	1	29	29	*2.9*	*11*	*L*	*6.9*	*L*	*6.9*	*L*	*15*		*25*		*21*	*L*	*14*	*L*	*13*	*L*	*8.4*	*L*
Barium	mg/kg	190000	190000	200	8200	8200	*820*	160		87		88		*1300*		120		220		140		330		55	
Cadmium	mg/kg	1400	190000	0.5	38	38	*3.8*	2.1		0.31		0.25		*4*		2.1		2		0.48		1.7		0.36	
Chromium	mg/kg	190000	190000	10	190000	190000	19000	39	L	96	L	110	L	160	K	31	K	130	L	27	L	96	L	12	L
Lead	mg/kg	**1000**	190000	0.5	450	450	*45*	*960*		*190*		*220*		***14000***		*260*		***1700***		*680*		***8700***		*100*	
Selenium	mg/kg	14000	190000	5	26	26	*2.6*	1.4	JB	0.97		0.89		*4.2*	*J*	*3.1*	*J*	1.1	JB	0.78		1.8	JB	0.55	
Silver	mg/kg	14000	190000	10	84	84	8.4	1.2	U	0.095	J	0.085	J	0.33	J	0.2	J	2.2		0.34		1		0.042	J
Mercury	mg/kg	450	190000	0.2	10	10	*1*	0.55		*1.9*		*1.8*		0.18	K	0.13	K	0.62		0.27		0.36		0.035	J

TOTAL METALS RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. -GREENVILLE, PENNSYLVANIA

Sample Location:		PADEP MSCs Non-Residential						GAI-S18		GAI-S19		GAI-S20		GAI-S21		GAI-S22		GAI-S23		GAI-S24		GAI-S25		GAI-S26	
Sample Date:								7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/26/2011		7/26/2011	
Sample Type Code:								N		N		N		N		N		N		N		N		N	
Start Depth (feet):				Soil to Groundwater				0		0		0		0		0		0		0		0		0	
End Depth (feet):		Direct Contact Soil		Used Aquifer, TDS<=2500 mg/l				7		6		6		9		9		8		9		7		7	
Parameter	Unit	0-2 feet	2-15 feet	100 X GW MSC	Generic Value	Max	1/10 Generic	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/kg	53	190000	1	29	29	*2.9*	1.8		2		2	L	*6.3*		*11*		*7*		*10*		*11*	L	*8.3*	
Barium	mg/kg	190000	190000	200	8200	8200	*820*	16		11		25		29		120		59		87		190		140	
Cadmium	mg/kg	1400	190000	0.5	38	38	*3.8*	0.13		0.094	J	0.47		0.25		0.65		0.44		0.47		1.7		0.56	
Chromium	mg/kg	190000	190000	10	190000	190000	19000	32	K	57	K	12	L	13	K	28	K	31	K	63	K	67	L	310	K
Lead	mg/kg	**1000**	190000	0.5	450	450	*45*	*62*		*45*		*230*		30		***1800***		*550*		*170*		***3400***		***1700***	
Selenium	mg/kg	14000	190000	5	26	26	*2.6*	0.16	J	0.25	J	0.34	J	0.5	J	1.4		0.51	J	0.77		0.69		0.86	
Silver	mg/kg	14000	190000	10	84	84	8.4	0.018	J	0.012	J	0.036	J	0.022	J	0.081	J	0.073	J	0.3		0.59		0.2	
Mercury	mg/kg	450	190000	0.2	10	10	*1*	0.049	K	0.016	K	0.09		0.3	K	0.51	K	0.047	K	0.1	K	0.14		0.41	K

Sample Location:		PADEP MSCs Non-Residential						GAI-S27		GAI-S28		GAI-S29		GAI-S29		GAI-S30		GAI-S31		GAI-S32		GAI-S33	
Sample Date:								7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011	
Sample Type Code:								N		N		N		FD		N		N		N		N	
Start Depth (feet):				Soil to Groundwater				0		0		0		0		0		0		0		0	
End Depth (feet):		Direct Contact Soil		Used Aquifer, TDS<=2500 mg/l				8		7		10		10		10		15		14		11	
Parameter	Unit	0-2 feet	2-15 feet	100 X GW MSC	Generic Value	Max	1/10 Generic	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/kg	53	190000	1	29	29	*2.9*	*23*	*L*	*13*	*L*	*11*	*L*	*12*	*L*	*8.4*	*L*	*11*	*L*	*19*	*L*	*13*	*L*
Barium	mg/kg	190000	190000	200	8200	8200	*820*	320		110		180		140		85		49		93		63	
Cadmium	mg/kg	1400	190000	0.5	38	38	*3.8*	1.4		1.7		0.56		0.55		0.39		0.25		0.32		0.29	
Chromium	mg/kg	190000	190000	10	190000	190000	19000	2600	L	95	L	66	L	130	L	20	L	24	L	18	L	17	L
Lead	mg/kg	**1000**	190000	0.5	450	450	*45*	***2000***		*510*		*300*		*520*		*140*		*180*		*98*		*94*	
Selenium	mg/kg	14000	190000	5	26	26	*2.6*	1.5	JB	1.1		0.92		0.79		0.9		0.53		0.81		0.61	
Silver	mg/kg	14000	190000	10	84	84	8.4	0.45	J	0.28		1.1		1.2		0.046	J	0.23		0.044	J	0.038	J
Mercury	mg/kg	450	190000	0.2	10	10	*1*	0.18		0.23		0.11		0.11		0.051		0.033	J	0.11		0.13	

Notes:
N = primary sample
FD = field duplicate
mg/kg - milligrams per kilogram
NA = not analyzed
NS = standard not available
MSCs - Medium Specific Concentrations
PADEP - Pennsylvania Department of Environmental Protection
Qual = validated qualifier
J = estimated value
K = estimated value, biased high
L = estimated value, biased low
U = not detected above reporting limit

Results above the PA Non-Residential Direct Contact (0-2 ft) Values are shown in **bold**.
Results above the PA Non-Residential Soil to Groundwater (Used Aquifer, TDS <=2500 mg/L) Max MSCs are underlined.
Results above the PA Non-Residential Soil to Groundwater (Used Aquifer, TDS <=2500 mg/L) 1/10 Generic MSCs are shown in italics.
PADEP MSCs Source: PADEP Website
http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/10307/statewide_health_standards/552039

Checked by: EHJ

TCLP METALS RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

		Sample ID	GAI-S-S1		GAI-S2		GAI-S3		GAI-S4		GAI-S5		GAI-S6		GAI-S7		GAI-S8		GAI-S9	
		Sample Date	7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/28/2011		7/27/2011		7/27/2011	
		N=Normal, FD=Field Duplicate	N		N		N		N		N		N		N		N		N	
		start_depth	0		0		0		0		0		0		0		0		0	
		end_depth	2		6		2		2		2		2		2		18		6	
Parameter	Unit	TCLP HAZ CHAR LEVELS	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/L	5	0.05	U	0.05	U	0.05	U	0.003	J	0.05	U	0.009	J	0.05	U	0.25	U	0.016	J
Barium	mg/L	100	1		1		1.8		1.4		0.33		0.43		0.42		0.38	J	0.37	
Cadmium	mg/L	1	0.0014	J	0.0022	J	0.018	J	0.012	J	0.00088	J	0.00046	JB	0.0011	JB	0.011	J	0.00036	J
Chromium	mg/L	5	0.0025	J	0.0057	J	0.1	U	0.008	J	0.019	J	0.0013	J	0.008	J	0.19	J	0.05	U
Lead	mg/L	**5**	0.67		**5.6**		**38**		**9.5**		1.2		0.023	J	0.31		**11**		0.05	U
Selenium	mg/L	1	0.0049	JB	0.0043	JB	0.1	U	0.0052	JB	0.0089	JB	0.013	JB	0.0055	JB	0.25	U	0.0047	JB
Silver	mg/L	5	0.05	U	0.05	U	0.1	U	0.05	U	0.05	U	0.05	U	0.05	U	0.25	U	0.05	U
Mercury	mg/L	0.2	0.0002	U	5.20E-05	J	4.60E-05	J	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U

		Sample ID	GAI-S10		GAI-S11		GAI-S11		GAI-S12		GAI-S13		GAI-S14		GAI-S15		GAI-S16		GAI-S17	
		Sample Date	7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011	
		N=Normal, FD=Field Duplicate	N		N		FD		N		N		N		N		N		N	
		start_depth	0		0		0		0		0		0		0		0		0	
		end_depth	6		6		6		1		1		3		2		2		8	
Parameter	Unit	TCLP HAZ CHAR LEVELS	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/L	5	0.0071	J	0.25	UJ	0.0038	J	0.05	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Barium	mg/L	100	0.28		0.05	J	0.2	J	1.1	L	0.24	J	1.3		0.64	J	1.4		0.12	J
Cadmium	mg/L	1	0.0011	J	0.25	UJ	0.05	UJ	0.037	J	0.0069	J	0.0049	J	0.25	U	0.014	J	0.25	U
Chromium	mg/L	5	0.0014	J	0.25	UJ	0.0037	J	0.0027	J	0.0032	J	0.0039	J	0.0039	J	0.25	U	0.25	U
Lead	mg/L	**5**	0.0027	J	0.25	UJ	0.05	UJ	**37**	**L**	0.023	J	0.94		0.25		**5.6**		0.012	J
Selenium	mg/L	1	0.0045	JB	0.25	UJ	0.0065	JB	0.05	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Silver	mg/L	5	0.05	U	0.25	UJ	0.05	UJ	0.05	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Mercury	mg/L	0.2	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U

Checked by: EHJ

TCLP METALS RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

		Sample ID	GAI-S18		GAI-S19		GAI-S20		GAI-S21		GAI-S22		GAI-S23		GAI-S24		GAI-S25		GAI-S26	
		Sample Date	7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/26/2011		7/26/2011	
		N=Normal, FD=Field Duplicate	N		N		N		N		N		N		N		N		N	
		start_depth	0		0		0		0		0		0		0		0		0	
		end_depth	7		6		6		9		9		8		9		7		7	
Parameter	Unit	TCLP HAZ CHAR LEVELS	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/L	5	0.0027	J	0.014	J	0.0077	J	0.0048	J	0.0093	J	0.0047	J	0.0034	J	0.25	U	0.05	U
Barium	mg/L	100	0.44	L	0.42	L	0.42		0.084	L	0.28	L	0.67	L	0.6	L	0.75	J	0.86	L
Cadmium	mg/L	1	0.00078	J	0.0018	J	0.0069	J	0.0035	J	0.0031	J	0.0052	J	0.0022	J	0.012	J	0.0056	J
Chromium	mg/L	5	0.005	J	0.0056	J	0.0028	J	0.00084	J	0.0015	J	0.007	J	0.0021	J	0.25	U	0.01	J
Lead	mg/L	**5**	0.04	L	0.05	L	0.13		0.015	L	0.027	L	1.7	L	0.044	L	**28**		**7.8**	**L**
Selenium	mg/L	1	0.0051	JB	0.0067	JB	0.0064	JB	0.05	U	0.0043	JB	0.0058	JB	0.0064	JB	0.25	U	0.0045	JB
Silver	mg/L	5	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.25	U	0.05	U
Mercury	mg/L	0.2	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	4.00E-05	J

		Sample ID	GAI-S27		GAI-S28		GAI-S29		GAI-S29		GAI-S30		GAI-S31		GAI-S32		GAI-S33	
		Sample Date	7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011		7/26/2011	
		N=Normal, FD=Field Duplicate	N		N		N		FD		N		N		N		N	
		start_depth	0		0		0		0		0		0		0		0	
		end_depth	8		7		10		10		10		15		14		11	
Parameter	Unit	TCLP HAZ CHAR LEVELS	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arsenic	mg/L	5	0.25	U	0.071	J	0.25	U	0.25	U	0.0097	J	0.25	U	0.25	U	0.25	U
Barium	mg/L	100	0.84	J	0.82	J	0.73	J	0.66	J	0.66		0.44	J	0.38	J	0.61	J
Cadmium	mg/L	1	0.02	J	0.25	U	0.0019	J	0.0022	J	0.0017	J	0.002	J	0.002	J	0.002	J
Chromium	mg/L	5	0.0045	J	0.0089	J	0.0048	J	0.0036	J	0.0022	J	0.25	U	0.25	U	0.25	U
Lead	mg/L	**5**	0.91		0.18	J	0.38		0.16	J	0.072		0.57		0.057	J	0.094	J
Selenium	mg/L	1	0.25	U	0.25	U	0.25	UJ	0.015	J	0.0046	JB	0.25	U	0.25	U	0.015	J
Silver	mg/L	5	0.25	U	0.25	U	0.25	U	0.25	U	0.05	U	0.25	U	0.25	U	0.25	U
Mercury	mg/L	0.2	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U	0.0002	U

Notes:
N = primary sample
FD = field duplicate
mg/L = milligrams per liter
Qual = validated qualifier
B = possible blank contamination
J = estimated value
L = estimated value, biased low
U = not detected above reporting limit

Results above the TCLP Hazardous Characterization Levels are shown in **bold**.

Checked by: EHJ

TABLE B-4
CORROSIVITY RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

		Sample Location:	GAI-S5		GAI-S6		GAI-S7		GAI-S8		GAI-S9		GAI-S10		GAI-S11		GAI-S11	
		Sample Date:	7/28/2011		7/28/2011		7/28/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011		7/27/2011	
		Sample Type Code:	N		N		N		N		N		N		N		FD	
		Start Depth (feet):	0		0		0		0		0		0		0		0	
		End Depth (feet):	2		2		2		18		6		6		6		6	
Parameter	Unit	Hazardous Waste Level (EPA Waste Number)	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
pH	SU	≤ 2 and ≥12.5 (D002)	8.1		8.5		7.7		7.33		7.68		7.83		11.6		11.8	

Notes:
N = primary sample
FD = field duplicate
Qual = validated qualifier
SU = standard units

Checked by: EHJ

Golder Associates

TABLE B-5
VOC RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

Sample Location:		PADEP MSCs Non-Residential						GAI-S8	
Sample Date:								7/27/2011	
Start Depth (feet):		Direct Contact Soil		Soil to Groundwater Used Aquifer, TDS<=2500 mg/l				3	
End Depth (feet):								4	
Parameter	Unit	0-2 feet	2-15 feet	100 X GW MSC	Generic Value	Max	1/10 Generic	Result	Qual
1,1,1-Trichloroethane	ug/kg	1.00E+07	1.00E+07	20000	7200	20000	*720*	*7600*	*U*
1,1,2,2-Tetrachloroethane	ug/kg	38000	44000	430	130	430	*13*	*7600*	*U*
1,1,2-Trichloroethane	ug/kg	140000	160000	500	150	500	*15*	*7600*	*U*
1,1-Dichloroethane	ug/kg	1400000	1600000	16000	3900	16000	*390*	*7600*	*U*
1,1-Dichloroethene	ug/kg	1.00E+07	1.00E+07	700	190	700	*19*	*7600*	*U*
1,2,4-Trichlorobenzene	ug/kg	1.00E+07	1.00E+07	7000	27000	27000	*2700*	*7600*	*U*
1,2-Dibromo-3-chloropropane	ug/kg	**370**	**430**	20	9.2	20	*0.92*	***7600***	***U***
1,2-Dibromoethane	ug/kg	**3700**	**4300**	5	1.2	5	*0.12*	***7600***	***U***
1,2-Dichlorobenzene	ug/kg	1.00E+07	1.00E+07	60000	59000	60000	*5900*	*7600*	*U*
1,2-Dichloroethane	ug/kg	86000	98000	500	100	500	*10*	*7600*	*U*
1,2-Dichloropropane	ug/kg	220000	260000	500	110	500	*11*	*7600*	*U*
1,3-Dichlorobenzene	ug/kg	8400000	1.00E+07	60000	61000	61000	*6100*	*7600*	*U*
1,4-Dichlorobenzene	ug/kg	200000	230000	7500	10000	10000	*1000*	*7600*	*U*
2-Butanone	ug/kg	1.00E+07	1.00E+07	400000	76000	400000	*7600*	*7600*	*U*
2-Hexanone	ug/kg	400000	460000	4400	1100	4400	*110*	*7600*	*U*
4-Methyl-2-pentanone	ug/kg	1.00E+07	1.00E+07	820000	130000	820000	13000	11000	
Acetone	ug/kg	1.00E+07	1.00E+07	9200000	1.00E+06	9200000	100000	30000	U
Benzene	ug/kg	290000	330000	500	130	500	*13*	*7600*	*U*
Bromodichloromethane	ug/kg	60000	69000	8000	2700	8000	*270*	*7600*	*U*
Bromoform	ug/kg	2000000	2300000	8000	3500	8000	*350*	*7600*	*U*
Bromomethane	ug/kg	400000	460000	1000	540	1000	*54*	*7600*	*U*
Carbon Disulfide	ug/kg	1.00E+07	1.00E+07	620000	530000	620000	53000	7600	U
Carbon Tetrachloride	ug/kg	150000	170000	500	260	500	*26*	*7600*	*U*
Chlorobenzene	ug/kg	4000000	4600000	10000	6100	10000	*610*	*7600*	*U*
Chloroethane	ug/kg	1.00E+07	1.00E+07	90000	19000	90000	*1900*	*7600*	*U*
Chloroform	ug/kg	97000	110000	8000	2000	8000	*200*	*7600*	*U*
Chloromethane	ug/kg	1200000	1400000	3000	380	3000	*38*	*7600*	*U*
cis-1,2-Dichloroethene	ug/kg	1.00E+07	1.00E+07	7000	1600	7000	*160*	*7600*	*U*
cis-1,3-Dichloropropene	ug/kg	560000	640000	2600	460	2600	*46*	*7600*	*U*
Cyclohexane	ug/kg	1.00E+07	1.00E+07	5300000	6900000	6900000	690000	7600	U
Dibromochloromethane	ug/kg	82000	95000	8000	2500	8000	*250*	*7600*	*U*
Dichlorodifluoromethane	ug/kg	1.00E+07	1.00E+07	100000	100000	100000	10000	7600	U
Ethylbenzene	ug/kg	1.00E+07	1.00E+07	70000	46000	70000	*4600*	*92000*	
Freon 113	ug/kg	1.00E+07	1.00E+07	1.00E+07	1.00E+07	1.00E+07	1.00E+06	7600	U
Isopropylbenzene	ug/kg	1.00E+07	1.00E+07	350000	2500000	2500000	250000	110000	
Methyl Acetate	ug/kg	1.00E+07	1.00E+07	1.00E+07	1900000	1.00E+07	190000	7600	U
Methyl Cyclohexane	ug/kg	NS	NS	NS	NS	NS	NS	7600	U
Methyl tert-Butyl Ether	ug/kg	8600000	9900000	96000	14000	96000	*1400*	*7600*	*U*
Methylene Chloride	ug/kg	4700000	5400000	500	76	500	*7.6*	*7600*	*U*
Styrene	ug/kg	1.00E+07	1.00E+07	10000	24000	24000	*2400*	*7600*	*U*
Tetrachloroethene	ug/kg	1500000	4400000	500	430	500	*43*	*7600*	*U*
Toluene	ug/kg	1.00E+07	1.00E+07	100000	44000	100000	*4400*	*83000*	
trans-1,2-Dichloroethene	ug/kg	4800000	5500000	10000	2300	10000	*230*	*7600*	*U*
trans-1,3-Dichloropropene	ug/kg	560000	640000	2600	460	2600	*46*	*7600*	*U*
Trichloroethene	ug/kg	1300000	1500000	500	170	500	*17*	*7600*	*U*
Trichlorofluoromethane	ug/kg	1.00E+07	1.00E+07	200000	87000	200000	8700	7600	U
Vinyl Chloride	ug/kg	110000	580000	200	27	200	*2.7*	*7600*	*U*
Xylenes, Total	ug/kg	8000000	9100000	1.00E+06	990000	1.00E+06	*99000*	*660000*	

Notes:
ug/kg - micrograms per kilogram
NS = standard not available
MSCs - Medium Specific Concentrations
PADEP - Pennsylvania Department of Environmental Protection
Qual = validated qualifier
U = not detected above reporting limit

Results above the PA Non-Residential Direct Contact (0-2 ft) Values are shown in **bold.**
Results above the PA Non-Residential Soil to Groundwater (Used Aquifer, TDS <=2500 mg/L) Max MSCs are underlined.
Results above the PA Non-Residential Soil to Groundwater (Used Aquifer, TDS <=2500 mg/L) 1/10 Generic MSCs are shown in *italics*.

PADEP MSCs Source: PADEP Website
http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/10307/statewide_health_standards/552039

Checked by: SLJ

TABLE B-6
GEOTECHNICAL TESTING SUMMARY
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

Site Location	AOC	Sample Identification	Sample Type	Sample Depth	Soil Classification USCS symbol	Natural Moisture Content %	Grain Size Distribution			Compaction		Compaction (Corrected)		UU Triaxial Test	
							Gravel %	Sand %	Fines %	Maximum Dry Density (lb/cuft)	Optimum Moisture %	Maximum Dry Density (lb/cuft)	Optimum Moisture %	Friction angle phi degrees	cohesion c psf
Former Operation Areas	AOC-S21	GAI-S2	Bulk	0.0-6.0'	(SM)	19.1	26.6	50.8	22.6	100.9	18.4	105.8	16.1	26.5	447.2
	AOC-S3	GAI-S8	Bulk	0.0-18.0'	(ML)	24.1	9.4	36.0	54.6	115.6	13.6	117.3	12.8	29.4	749.8
Drainage Areas	General Downgradient - SW1	GAI-S14	Bulk	0.0-3.0'	(SM)	8.0	42.3	42.5	15.2	127.7	14.3	131.7	13.0	27.8	386.6
	General Downgradient - SW2	GAI-S17	Bulk	0.0-8.0'	(ML)	25.9	5.0	41.3	53.7	109.9	15.7	-	-	26.0	674.7
Former Disposal Areas	AOC-S17	GAI-S18	Bulk	0.0-7.0'	(SM)	9.3	3.6	82.4	14.0	106.5	13.7	-	-	27.9	230.9
	AOC-S17	GAI-S21	Bulk	0.0-9.0'	(SM)	44.1	3.4	48.8	47.8	103.8	20.4	-	-	24.7	759.8
	AOC-S11	GAI-S26	Bulk	0.0-7.0'	(ML)	27.3	11.9	28.7	59.4	102.8	21.1	107.2	19.3	21.3	731.9
	AOC-S1	GAI-S31	Bulk	0.0-15.0'	(SM)	12.6	13.6	52.6	33.8	116.5	13.8	120.7	12.8	25.4	434.3

ABBREVIATIONS: UU = UNCONSOLIDATED UNDRAINED COMPRESSION TEST
Mc = MOISTURE (As seen in Grain size distribution charts)
SM = Silty SAND
ML = SILT

NOTES:

1. Sample ID GAI-S-xx is synonymous with sample ID GAI-Sxx as shown on Figure 1 and in the text of the report. For example GAI-S-2 is same as GAI-S2.
2. USCS symbol is based on visual observation and sieve results reported by the geotechnical laboratory.
3. The corrected maximum dry density and optimum moisture content results should be used in calculations for sample numbers GAI-S-2, GAI-S-8, GAI-S-14, GAI-S-26 and GAI-S-31. The corrections were made due to the presence of oversized particles in the samples collected. Refer "Principles of Foundation Engineering" by Braja M. Das, 5th Edition,Chapter

SOIL VAPOR INTRUSION RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

					Sample ID	SVI-S1			SVI-S2			SVI-S3			SVI-S3		
					Sample Date	8/16/2011			8/16/2011			8/16/2011			8/16/2011		
					N=Normal; FD=Field Duplicate	N			N			N			FD		
Parameter	cas_rn	Units	PADEP Non-Residential MSCs for Indoor Air	Calculated Non-Residential MSCs for Soil Gas		Result	Qualifier	Rept Limit	Result	Qualifier	Rept Limit	Result	Qualifier	Rept Limit	Result	Qualifier	Rept Limit
1,1,1-Trichloroethane	71-55-6	µg/m³	6,100	610,000		< 11	U	11	< 11	U	11	< 11	U	11	< 11	U	11
1,1,2,2-Tetrachloroethane	79-34-5	µg/m³	1.4	140		< 14	U	14	< 14	U	14	< 14	U	14	< 14	U	14
1,1,2-Trichloroethane	79-00-5	µg/m³	5.1	510		< 11	U	11	< 11	U	11	< 11	U	11	< 11	U	11
1,1-Dichloroethane	75-34-3	µg/m³	50	5,000		< 8	U	8	< 8	U	8	< 8	U	8	< 8	U	8
1,1-Dichloroethene	75-35-4	µg/m³	580	58,000		< 8	U	8	< 8	U	8	< 8	U	8	< 8	U	8
1,2,4-Trichlorobenzene	120-82-1	µg/m³	79	7,900		< 37	U	37	< 37	U	37	< 37	U	37	< 37	U	37
1,2,4-Trimethylbenzene	95-63-6	µg/m³	17	1,700		190		10	< 10	U	10	< 10	U	10	< 10	U	10
1,2-Dibromoethane	106-93-4	µg/m³	0.37	37		< 15	U	15	< 15	U	15	< 15	U	15	< 15	U	15
1,2-Dichlorobenzene	95-50-1	µg/m³	410	41,000		< 12	U	12	< 12	U	12	< 12	U	12	< 12	U	12
1,2-Dichloroethane	107-06-2	µg/m³	3.1	310		< 8	U	8	< 8	U	8	< 8	U	8	< 8	U	8
1,2-Dichloropropane	78-87-5	µg/m³	7.9	790		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
1,2-Dichlorotetrafluoroethane	76-14-2	µg/m³	NS	NS		< 14	U	14	< 14	U	14	< 14	U	14	< 14	U	14
1,3,5-Trimethylbenzene	108-67-8	µg/m³	17	1,700		140		10	< 10	U	10	< 10	U	10	< 10	U	10
1,3-Butadiene	106-99-0	µg/m³	2.6	260		< 4	U	4	< 4	U	4	< 4	U	4	< 4	U	4
1,3-Dichlorobenzene	541-73-1	µg/m³	NS	NS		< 12	U	12	< 12	U	12	< 12	U	12	< 12	U	12
1,4-Dichlorobenzene	106-46-7	µg/m³	13	1,300		< 12	U	12	< 12	U	12	< 12	U	12	< 12	U	12
2,2,4-Trimethylpentane	540-84-1	µg/m³	NS	NS		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
2-Butanone	78-93-3	µg/m³	2,900	290,000		< 15	U	15	< 15	U	15	< 15	U	15	< 15	U	15
2-Chlorotoluene	95-49-8	µg/m³	200	20,000		< 10	U	10	< 10	U	10	< 10	U	10	< 10	U	10
4-Ethyltoluene	622-96-8	µg/m³	NS	NS		28		10	< 10	U	10	< 10	U	10	< 10	U	10
4-Methyl-2-pentanone	108-10-1	µg/m³	200	20,000		< 20	U	20	< 20	U	20	< 20	U	20	< 20	U	20
Acetone	67-64-1	µg/m³	91,000	9,100,000		< 120	U	120	< 120	U	120	< 120	U	120	< 120	U	120
Allyl Chloride	107-05-1	µg/m³	2.9	290		< 16	U	16	< 16	U	16	< 16	U	16	< 16	U	16
Benzene	71-43-2	µg/m³	11	1,100		< 6	U	6	< 6	U	6	< 6	U	6	< 6	U	6
Bromodichloromethane	75-27-4	µg/m³	2.2	220		< 13	U	13	< 13	U	13	< 13	U	13	< 13	U	13
Bromoform	75-25-2	µg/m³	74	7,400		< 21	U	21	< 21	U	21	< 21	U	21	< 21	U	21
Bromomethane	74-83-9	µg/m³	14	1,400		< 8	U	8	< 8	U	8	< 8	U	8	< 8	U	8
Carbon Disulfide	75-15-0	µg/m³	2,000	200,000		< 16	U	16	< 16	U	16	< 16	U	16	< 16	U	16
Carbon Tetrachloride	56-23-5	µg/m³	5.5	550		< 13	U	13	< 13	U	13	< 13	U	13	< 13	U	13
Chlorobenzene	108-90-7	µg/m³	51	5,100		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
Chloroethane	75-00-3	µg/m³	99	9,900		< 13	U	13	< 13	U	13	< 13	U	13	< 13	U	13
Chloroform	67-66-3	µg/m³	0.92	92		< 10	U	10	< 10	U	10	< 10	U	10	< 10	U	10
Chloromethane	74-87-3	µg/m³	45	4,500		< 10	U	10	< 10	U	10	< 10	U	10	< 10	U	10
cis-1,2-Dichloroethene	156-59-2	µg/m³	100	10,000		< 8	U	8	< 8	U	8	< 8	U	8	< 8	U	8

Checked by: KVN Date: 9/22/2011

SOIL VAPOR INTRUSION RESULTS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

					Sample ID	SVI-S1			SVI-S2			SVI-S3			SVI-S3		
					Sample Date	8/16/2011			8/16/2011			8/16/2011			8/16/2011		
					N=Normal; FD=Field Duplicate	N			N			N			FD		
Parameter	cas_rn	Units	PADEP Non-Residential MSCs for Indoor Air	Calculated Non-Residential MSCs for Soil Gas		Result	Qualifier	Rept Limit	Result	Qualifier	Rept Limit	Result	Qualifier	Rept Limit	Result	Qualifier	Rept Limit
cis-1,3-Dichloropropene [2]	10061-01-5	µg/m³	20	2,000		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
Cyclohexane	110-82-7	µg/m³	NS	NS		< 7	U	7	< 7	U	7	< 7	U	7	< 7	U	7
Dibromochloromethane	124-48-1	µg/m³	3	300		< 17	U	17	< 17	U	17	< 17	U	17	< 17	U	17
Dichlorodifluoromethane	75-71-8	µg/m³	510	51,000		< 25	U	25	< 25	U	25	< 25	U	25	< 25	U	25
Ethylbenzene	100-41-4	µg/m³	73	7,300		39		9	< 9	U	9	< 9	U	9	< 9	U	9
Freon 113	76-13-1	µg/m³	88,000	8,800,000		< 15	U	15	< 15	U	15	< 15	U	15	< 15	U	15
Hexachlorobutadiene	87-68-3	µg/m³	NS	NS		< 21	U	21	< 21	U	21	< 21	U	21	< 21	U	21
m,p-Xylenes [1]	179601-23-1	µg/m³	300	30,000		170		22	< 22	U	22	< 22	U	22	< 22	U	22
Methyl tert-Butyl Ether	1634-04-4	µg/m³	310	31,000		< 7	U	7	< 7	U	7	< 7	U	7	< 7	U	7
Methylene Chloride	75-09-2	µg/m³	170	17,000		< 17	U	17	< 17	U	17	< 17	U	17	< 17	U	17
n-Heptane	142-82-5	µg/m³	NS	NS		< 8	U	8	< 8	U	8	45		8	55		8
n-Hexane	110-54-3	µg/m³	580	58,000		7		7	< 7	U	7	64		7	74		7
o-Xylene [1]	95-47-6	µg/m³	300	30,000		88		9	< 9	U	9	< 9	U	9	< 9	U	9
Styrene	100-42-5	µg/m³	2,900	290,000		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
tert-Butyl Alcohol	75-65-0	µg/m³	NS	NS		< 150	U	150	< 150	U	150	< 150	U	150	< 150	U	150
Tetrachloroethene	127-18-4	µg/m³	140	14,000		400		14	52		14	< 14	U	14	< 14	U	14
Toluene	108-88-3	µg/m³	1,200	120,000		19		8	< 8	U	8	9		8	11		8
trans-1,2-Dichloroethene	156-60-5	µg/m³	200	20,000		< 8	U	8	< 8	U	8	< 8	U	8	< 8	U	8
trans-1,3-Dichloropropene [2]	10061-02-6	µg/m³	20	2,000		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
Trichloroethene	79-01-6	µg/m³	48	4,800		< 11	U	11	< 11	U	11	< 11	U	11	< 11	U	11
Trichlorofluoromethane	75-69-4	µg/m³	2,000	200,000		< 11	U	11	< 11	U	11	< 11	U	11	< 11	U	11
Vinyl Bromide	593-60-2	µg/m³	2.6	260		< 9	U	9	< 9	U	9	< 9	U	9	< 9	U	9
Vinyl Chloride	75-01-4	µg/m³	9.5	950		< 5	U	5	< 5	U	5	< 5	U	5	< 5	U	5

Notes:
NS = No Standard
ug/m3 = micrograms per cubic meter
PADEP Non-Residential MSC for Indoor Air: Table 3 of of PADEP's Guidance for Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard"
MSCs for soil gas = MSC for Indoor Air/Transfer factor from soil gas to indoor air of 0.01; page 53 of PADEP's Guidance for Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard"
Detected results greater than soil gas MSC are **bolded.**
[1] - PADEP MSC presented is for total xylenes.
[2] - PADEP MSC presented is for total 1,3-dichloropropene

Checked by: KVN Date: 9/22/2011

TABLE B-8
WATER ELEVATIONS
PRE-DESIGN INVESTIGATIONS - SOUTH PLANT
TRINITY INDUSTRIES, INC. - GREENVILLE, PENNSYLVANIA

WELL I.D.	Ground Surface [ft MSL]	Measuring Point [ft MSL]	April 28, 2008		September 9, 2008		March 9, 2009		May 4, 2009		June 22, 2009		September 22, 2011	
			Depth to Water [feet bmp]	Groundwater Elevation [feet msl]	Depth to Water [feet bmp]	Water Elevation [feet msl]	Depth to Water [feet bmp]	Water Elevation [feet msl]	Depth to Water [feet bmp]	Water Elevation [feet msl]	Depth to Water [feet bmp]	Water Elevation [feet msl]	Depth to Water [feet bmp]	Water Elevation [feet msl]
MW-S1	936.10	938.67	5.59	933.08	6.83	931.84	3.75	934.92	5.67	933.00	5.33	933.34	5.76	932.91
MW-S2	938.86	941.43	5.72	935.71	6.47	934.96	5.02	936.41	5.76	935.67	5.30	936.13	5.47	935.96
MW-S3	940.51	942.82	6.05	936.77	6.64	936.18	5.34	937.48	5.91	936.91	5.78	937.04	5.92	936.90
MW-S4	939.52	942.08	6.56	935.52	6.77	935.31	5.38	936.70	6.45	935.63	6.25	935.83	6.45	935.63
MW-S5	940.18	942.73	6.05	936.68	6.75	935.98	4.72	938.01	6.06	936.67	5.64	937.09	6.21	936.52
MW-S6	939.65	942.51	7.49	935.02	8.74	933.77	5.98	936.53	7.55	934.96	7.14	935.37	7.54	934.97
MW-S7	939.35	941.82	6.13	935.69	6.7	935.12	4.82	937.00	5.82	936.00	5.34	936.48	5.67	936.15
MW-S8	939.07	941.69	5.53	936.16	6.28	935.41	4.05	937.64	5.37	936.32	4.84	936.85	5.25	936.44
MW-S9	938.77	941.27	6.85	934.42	7.91	933.36	5.48	935.79	6.82	934.45	6.25	935.02	6.60	934.67
MW-S10	938.69	941.05	NA	NA	NA	NA	6.71	934.34	8.4	932.65	8.25	932.80	8.78	932.27
MW-S11	935.81	938.23	NA	NA	NA	NA	3.10	935.13	4.43	933.80	4.09	934.14	4.57	933.66
MW-S12	938.83	941.23	NA	NA	NA	NA	6.12	935.11	7.43	933.80	7.09	934.14	7.16	934.07
MW-S13	937.12	939.79	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.90	933.89
MW-S14	939.09	941.88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.28	935.60
SG-S1	NA	938.54	NA	NA	0.50	935.71	1.20	936.41	0.23	935.44	0.27	938.28	0.19	935.40
SG-S2	NA	937.39	NA	NA	1.14	935.20	2.35	936.41	0.83	934.89	0.90	936.49	1.04	935.10
SG-S3	NA	937.02	NA	NA	1.32	935.01	2.40	936.09	1.18	934.87	1.30	935.72	1.33	935.02
MW-CN1	943	942.88	NA	NA	NA	NA	5.30	937.58	5.85	937.03	5.63	937.25	NM	NA
MW-CN2	941.32	941.24	NA	NA	NA	NA	5.52	935.72	6.84	934.40	6.27	934.97	NM	NA
MW-CN3	942.46	942.12	NA	NA	NA	NA	6.10	936.02	6.94	935.18	6.52	935.60	NM	NA
MW-CN4	942.88	942.26	NA	NA	NA	NA	5.95	936.31	6.64	935.62	NA	NA	NA	NA

Notes:
1) ft BTOC - feet below top of casing
2) ft MSL - feet above Mean Sea Level
MW = Groundwater Monitoring Well
SG = Staff Gauge
NA = Not Applicable
NM - Not Measured
MW-CN4 abandoned by B&LE

APPENDIX E

GROUNDWATER, SURFACE WATER AND STORM WATER MONITORING PLAN

APPENDIX E - GROUNDWATER, SURFACE WATER, AND STORM WATER MONITORING PLAN

CLEANUP PLAN
SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

Prepared For: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

January 2012

Project No. 073-6009-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Figures

LIST OF ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
AOC	Area of Concern
ASTM	American Society for Testing and Materials
CLP	Contract Laboratory Program
COC	Contaminant of Concern
DQO	Data Quality Objectives
EDD	Electronic Data Deliverable
EPA	Environmental Protection Agency
FS	Feasibility Study
HASP	Health and Safety Plan
ID	Identification
ISS	In-situ Stabilization
MDL	Method Detection Limit
MS	Matrix Spike
MSCs	Medium-Specific Concentrations
MS/MSD	Matrix-Spike/Matrix-Spike Duplicate
NELAC	National Environmental Laboratory Accreditation Program
NIST	National Institute of Standards Technology
OSHA	Occupational Safety and Health Administration Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PE	Performance Evaluation
PPE	Personal Protective Equipment
ppb	parts per billion
ppm	parts per million
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Plan
QC	Quality Control
QMP	Quality Management Plan
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RL	Reporting Limit
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SOW	Statement of Work
SSHASP	Site-Specific Health and Safety Plan
UCL	Upper Confidence Level
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

This Groundwater, Surface Water, and Storm Water Monitoring Plan (Monitoring Plan) has been prepared by Golder Associates Inc. (Golder), on behalf of Trinity Industries, Inc. (Trinity) in conjunction with the Cleanup Plan for Trinity's South Plant property (South Plant or Site). It is intended to provide an approach and consistent confirmatory sampling procedures for both the proposed groundwater response actions and post-closure monitoring activities.

1.1 Site Description

The South Plant is defined collectively as the three parcels of real property that cover approximately 53 acres located at 100 York Street in the Borough of Greenville and Hempfield Township, Mercer County, Pennsylvania as shown in Figure 1.

The South Plant property is zoned for industrial uses and Trinity formerly operated a railcar manufacturing plant at the location. While there are currently no manufacturing activities at the Site and many of the buildings are vacant, the facility is occupied and sections of the Site are used for storage. The South Plant property contains approximately 15 buildings along with four exterior cranes and two transfer tables. These structures occupy about 1/3 of the property. The remaining areas of the South Plant consist of concrete and asphalt pavement, former building slabs, railroad track/sidings, areas with sparse vegetation, grassy open areas, and wooded areas. The South Plant is serviced by railroad tracks from the south and an active railroad line is located along the western property boundary.

The South Plant is located in a mixed use area consisting of residential properties to the north and east, industrial properties to the north and west, and wooded property to the south. An extension of the Old Erie Canal is located along the eastern boundary of the property and a stream, Mathay Run, crosses the southern portion of the property from east to the southwest. South of Mathay Run there is an area of mixed full grown trees and thick underbrush. Directly to the west of the South Plant are several industrial properties and the Shenango River is located just beyond those properties.

1.2 Groundwater Response Actions

Further response actions were identified for groundwater to demonstrate that on-Site concentrations of arsenic and manganese in groundwater exceeding the Residential Used Aquifer MSCs will not impact downstream receptors and that the proposed cleanup standards are protective of human health and the environment. These response actions include performing eight quarters of additional groundwater and surface water monitoring and semi-annual stormwater monitoring to accomplish the following:

- Demonstrate the continued presence of an effective hydraulic barrier at Mathay Run that intercepts impacted groundwater before it moves off-Site
- Demonstrate compliance with selected groundwater cleanup standards

- Continue to demonstrate that there are no unacceptable impacts to surface water from groundwater discharges to Mathay Run

1.3 Post Closure Monitoring Activities

At the conclusion of the groundwater response actions (quarterly monitoring), Trinity will perform additional long-term confirmatory groundwater, surface water, and storm water monitoring at the Site to demonstrate that there are no unacceptable releases from the closed Former Disposal Areas. This eight-year long-term monitoring program will include semi-annual monitoring for the first three years and annual monitoring for the next five years. Following completion of the final monitoring event and data evaluation confirming no unacceptable findings, monitoring activities will cease and notification will be provided to PADEP.

2.0 MONITORING PROGRAM

2.1 Quarterly Monitoring

2.1.1 Sampling Frequency

Commencing in the first calendar quarter after completion of remedial construction activities, Trinity will perform quarterly monitoring of groundwater and surface water for eight quarters. Monitoring will include measurement of water levels and water quality sampling as further discussed in Sections 2.1.2 and 3.3 of this plan. In addition, selected stormwater samples will be collected during the Spring and Fall quarterly events.

2.1.2 Sampling Locations

The proposed quarterly monitoring locations include 13 existing on-Site monitoring wells, six previously sampled surface water locations, and the following four stormwater locations:

- Outfall OF2 – at the outlet of a drainage pipe conveying flow from the Former Operations Area
- Outfall OF4 – at the outlet of the drainage channel along the western boundary of the site, conveying flow from the western portion of the Site and the adjacent railroad owned by others.
- New Outfall OF5 - at the outfall of the relocated diversion channel along the northern boundary of the Former Disposal Areas
- New Outfall OF6 – at the outlet of the new stormwater management basin constructed in support of the Former Disposal Areas cap construction

The proposed locations are shown on Figure 2. Some locations will be used for water level measurements only. Other locations will be used for both water level measurements and water quality monitoring. The quarterly monitoring program is summarized below:

Quarterly Monitoring Program

Media	Sample Location	Monitoring Requirements
Groundwater	MW-S1, MW-S2, MW-S3, MW-S4, MW-S5, MW-S6, MW-S7, MW-S9, MW-S10, MW-S11, MW-S12, MW-S13, MW-S14	Water Level Measurements and Water Quality Sampling
Surface Water	SS-S1, SS-S6, SS-S3	Water Quality Sampling
	SG-S1, SG-S2, SG-S3	Water Level Measurements Only
Stormwater	OF-2, OF-4, OF-5, OF-6	Water Quality Sampling in Spring and Fall Quarters Only

2.2 Long-Term Monitoring

2.2.1 Sampling Frequency

At the conclusion of the groundwater response actions, Trinity will perform confirmatory monitoring of groundwater, surface water, and stormwater semi-annually in the spring and fall for three years and then annually in the spring for five years, for a total of eight years of verification sampling. Trinity will evaluate the data annually to determine whether the ongoing monitoring continues to be representative and appropriate. Any recommendations regarding changes to the monitoring program will be submitted to PADEP for review and approval prior to implementing such changes.

Because significant rainfall events (large quantities of precipitation during short duration storm events) are required to generate runoff from Site at the outfall locations, the specific sampling period may be adjusted to coincide with predicted or actual storm events.

2.2.2 Sampling Locations

The proposed long-term monitoring locations are the same as those proposed for quarterly monitoring; however, the number of monitoring wells being sampled has been reduced to those wells around the former Disposal Areas and the perimeter of the Site. Water levels will measured at all the On-site monitoring wells. The long-term monitoring program is summarized below:

Long-term Monitoring Program

Media	Sample Location	Monitoring Requirements
Groundwater	MW-S1, MW-S3, MW-S4, MW-S6, MW-S10, MW-S11, MW-S13, MW-S14	Water Level Measurements and Water Quality Sampling
	MW-S2, MW-S5, MW-S7, MW-S9, MW-S12	Water Level Measurements Only
Surface Water	SS-S1, SS-S6, SS-S3	Water Quality Sampling Only
	SG-S1, SG-S2, SG-S3	Water Level Measurements Only
Stormwater	OF-2, OF-4, OF-5, OF-6	Water Quality Sampling Only

2.3 Water Quality Sampling Parameters

Groundwater, surface water, and stormwater samples will be analyzed for the following parameters by a Pennsylvania-licensed laboratory:

- Target Analyte List (TAL) Metals by SW-846 Method 6020
- Total Dissolved Solids.

3.0 SAMPLING PROCEDURES

3.1 Water Level Measurements

At selected monitoring wells and staff gauges, a field decontaminated electronic water level meter will be used to measure the depth from the top of the inner well casing (or equivalent measuring point) to the top of water surface to the nearest 0.01 feet.

Periodically (e.g., annually), the depth to the bottom of the well should be measured to confirm well construction details, however such measurements should not be made immediately prior to well purging or sample collection in order to minimize potential cross-contamination and disturbance to sediments which may have accumulated in the bottom of the well.

3.2 Groundwater Monitoring

Groundwater samples will be obtained from the monitoring wells using low-flow sampling techniques in accordance with the United States Environmental Protection Agency (USEPA) Region III, document entitled Groundwater Sampling Procedure Low Stress (Low Flow) Purging and Sampling Procedures (October, 1997). The low flow sampling procedure allows for the collection of representative groundwater samples from the selected aquifer with minimal disturbance to the aquifer and minimum amounts of purge water to manage and dispose. The following section discusses the equipment needed and sample collection procedures to be employed for collecting groundwater samples from Site monitoring wells.

3.2.1 Equipment

Equipment and supplies typically anticipated to be required for groundwater sampling include, but are not necessarily limited to the following:

- Latex and/or nitrile gloves;
- Buckets, drums or similar containers to hold decontamination water (if needed);
- Water quality meter(s) capable of in-line measurements for pH, specific conductance, dissolved oxygen (DO), temperature, and oxidation-reduction potential (ORP) with temperature sensor checked for accuracy against a thermometer that is traceable to the National Institute of Standards and Technology (NIST);
- In-line flow-through cell;
- Turbidity meter;
- 0.45 micron in-line filters
- Groundwater Sample Field Information Form;
- Chain of Custody (COC) form;
- Sample bottles and preservatives (provided by analytical laboratory) ;
- Sample cooler (provided by analytical laboratory);
- Ice;

- Water level meter;
- Monitoring plan with sample location map;
- Well construction information;
- Sample collection forms from prior event (if available);
- Air monitoring equipment, such as a photoionization detector (PID);
- Grundfos Redi-Flow II submersible pump (or equivalent);
- Grundfos Redi-Flow II control box (or equivalent);
- Teflon-lined polyethylene tubing (recommended for low-flow purge and sampling technique);
- Generator.

3.2.2 Sampling Procedure

A portable Grundfos Redi-Flo 2, or equivalent, submersible pump, with dedicated Teflon-lined polyethylene tubing, will be carefully lowered into the well to the midpoint of the well screen or open borehole interval. The water level indicator will be removed before lowering the pump as they may tangle and cause the pump and tubing to get stuck in the well. In those instances where the screened or open interval is not completely saturated, the pump will be lowered to the midpoint of the saturated interval, which will help ensure representative samples are collected from the water-bearing zone. A bungee cord should be securely wrapped around the pump electrical line and tubing, and secured to the top of the well to help hold the pump at the desired depth.

Next, the pump discharge tubing will be attached to the in-line flow-through cell with water quality meter attached. The meter will be calibrated in accordance with GFP-3 specifications. Following installation of the pump, the electrical line will be attached to the control box; and the power cord will be attached to the generator. Before turning on the control box, the pump speed control will be placed to the lowest setting. After the pump is turned on, the pump speed will slowly be increased until water is seen rising in the tubing. The pump speed will be adjusted such that groundwater discharge does not exceed well recharge by monitoring the water level while increasing or decreasing the pump flow. Once the flow-through cell is full, begin monitoring and recording field parameters as specified in following section.

3.2.2.1 Low-flow Groundwater Purging

The following information will be recorded in the Groundwater Sample Field Information Form for each sample point:

- Before Purging:
  - Date, time;
  - Well ID;
  - General well condition (inner and outer protective casing, whether locked, any damage, etc.)

- PID readings taken from the well immediately after the cap is removed (if applicable);
- Depth to water;
- Well depth (if measured);
- Construction well depth;
- Meter calibration time; and
- Site name, location, project number.

- Purging:
  - Start and end time for purging;
  - Purge device;
  - Purge rate;
  - Depth to water, pH, ORP, temperature, specific conductance, turbidity and dissolved oxygen (every 5 minutes);
  - Parameters to be analyzed; and,
  - Pump depth.

Purge each well at a rate of approximately 200 to 500 milliliters per minute. During purging, monitor the water level and adjust pumping rate such that the water level draw down is minimized (ideally no more than 0.3 feet drawdown during purge). If drawdown is excessive, the pump rate should be lowered to 200 ml/min (be sure to note lowered purge rates on the field form). There must be at least 2 feet of water maintained over the pump intake to prevent pump suction being broken, or entrainment of air in the sample. If there is risk of water level dropping to within 2 feet above the pump, the purge should be terminated, and well should be allowed to recharge sufficiently for sample collection.

Attach a field decontaminated Horiba U-22 water quality meter (or equivalent) that has been calibrated in accordance with GFP-3 and in-line flow-through cell to the discharge tubing. Measurements of temperature, pH, specific conductance, ORP, and DO will be taken with the Horiba installed in the flow-through cell so that they are recorded prior to the sample being exposed to the atmosphere. Turbidity measurements will be taken using a separate meter using discharge water from the flow cell. The field parameters will be recorded approximately every 5 minutes (or at a minimum of one flow cell volume exchange) until the parameters have stabilized over three (3) consecutive readings. Stabilization is considered achieved if:

- pH is within +/- 0.1;
- conductivity is within +/- 3%;
- temperature is within +/- 3%;
- ORP is within +/- 10 mV;
- turbidity is within +/- 10% (or is less than 5 NTU); and
- DO is within +/- 10% (or within 0.1 mg/l when the DO is less than 1 mg/l).

All measurements will be recorded on the sample collection form or in field notebooks.

If after 2 hours of purging indicator field parameters have not stabilized, one of three optional courses of action may be taken: a) continue purging until stabilization is achieved, b) discontinue purging, do not collect any samples, and record in log book that stabilization could not be achieved (documentation must describe attempts to achieve stabilization), c) discontinue purging, collect samples and provide full explanation of attempts to achieve stabilization.

3.2.2.2 Groundwater Sampling

The following information will be recorded in the Groundwater Sample Field Information Form for each sample point:

- Sampling:
  - Sample time
  - Weather conditions
  - Sampling method
  - Pertinent observations regarding sample characteristics (turbidity, color, etc.)
  - Results of field test kits, if any

Remove the flow-through cell from the discharge tubing, add a 0.45 micron in-line filter to the end of the tubing, and collect the samples directly from the discharge end of the filter. The pump flow rate may be as high as approximately 500 milliliters per minute depending on the well yield and turbidity of the sample.

All sample bottles will be filled by allowing the pump discharge to flow gently down the inside of the bottle with minimal turbulence. Cap each bottle as it is filled. The bottles will be preserved according to the specifications listed in the analytical methods. All samples must be labeled prior to sample collection, using indelible ink with the sample point identification, sampler's initials, sample date and time, preservative, and parameters for analysis.

Immediately after sample collection, sample bottles will be placed on ice and maintained at approximately 4° Celsius (C) until transported to the laboratory. Samples must be logged on a chain-of-custody form. following procedures detailed Section 6.0.

3.3 Surface Water and Stormwater Monitoring

To the maximum extent practical, surface water/stormwater samples will be collected during or shortly after precipitation events. Water depth will be recorded based on the water depth at the staff gauge in Mathay Run and the Old Erie Extension Canal. Precipitation data will also be collected for the storm event so that it can be correlated with the water level measurements. The following section discusses the

equipment needed and sample collection procedures to be employed for collecting representative surface water and stormwater samples at the Site.

3.3.1 Equipment

Equipment and supplies typically anticipated to be required for surface water/stormwater sampling include, but are not necessarily limited to the following:

- Latex and/or nitrile gloves;
- Rubber boots or waders, if required;
- Sampling device(s), if required, such as a sample container attached to an extendable pole;
- Field parameter meter for specific conductance, pH, temperature, redox, dissolved oxygen, turbidity and salinity;
- Filters and filter vessel , as required, for filtered metals;
- Field Logbook;
- Chain of Custody (COC) form;
- Sample bottles and preservatives (provided by analytical laboratory) ;
- Sample cooler (provided by analytical laboratory);
- Ice;
- Water level meter;
- Monitoring plan with sample location map.

3.3.2 Procedures

Prior to sample collection, water body characteristics (e.g., size, depth, and flow) should be recorded in the field logbook. Water quality measurements for surface water samples typically include temperature, pH, total hardness (as CaCO3), alkalinity (as CaCO3), salinity (parts per thousand, 0/00), conductivity (as umhos/cm), and dissolved oxygen (mg/l). The probes of the field parameter meter should be submerged at the sample location slightly downstream from where the sample bottles will be filled.

If physically entering the water body is required, slowly approach the sample site from downstream, but do not enter the actual sample area. If possible, avoid disturbing the bottom sediments. If the sediments do become suspended, do not collect them with the sample. If necessary, wait until the suspended particles settle down or flow out of the sampling area before collecting the sample.

Surface water and stormwater samples will be collected with a new non-preserved sample container. Slowly submerge sample container into the water. If possible, fill the container below the water surface, near mid-depth. If a sampling device is required (e.g. extendable pole with stainless steel cup) slowly submerge the device completely into the water. Collect a sufficient volume of water to fill all sample containers; several re-fillings of the device may be necessary.

The bottles will be preserved according to the specifications listed in the analytical methods. For pre-preserved analyses, slowly pour the sample into pre-preserved bottles taking care not to overflow the bottle resulting in the loss of preservative. Immediately cap the bottle after filling.

All samples must be labeled prior to sample collection, using indelible ink with the sample point identification, sampler's initials, sample date and time, preservative, and parameters for analysis.

Immediately after sample collection, sample bottles will be placed on ice and maintained at approximately 4° Celsius (C) until transported to the laboratory. Samples must be logged on a chain-of-custody form. following procedures detailed Section 6.0.

4.0 DECONTAMINATION AND IDW HANDLING

The following section provides general guidance for decontamination of environmental sampling and related equipment, and the handling of investigation-derived waste (IDW).

4.1 Equipment and Supplies

Equipment and supplies typically required for this procedure include, but are not necessarily limited to:

- Soap - must be phosphate-free laboratory detergent such as Liquinox® or Alconox. ®
- Tap water – must be water from a municipal drinking water treatment system.
- Deionized water – must be tap water that has been run through a standard deionizing resin column. It is commercially available. For this project, the deionized water must not contain any heavy metals or other inorganic compounds (i.e., at or above the analytical detection limits as defined by the inductively coupled Argon Plasma Spectrophotometer (ICP) scan standard analytical method or equivalent method).
- Distilled water – must be tap water that has been distilled. It is commercially available.
- Analyte free water – must be tap water that has been treated with activated carbon and a standard deionizing resin column. The analyte free water must not contain any constituents above the laboratory reporting limits that are being analyzed as part of this investigation.
- Latex and/or nitrile gloves
- Scrub brushes
- Rinsate collection basins
- 5 gallon buckets and lids
- Paper towels
- Aluminum foil
- Plastic trash bags
- Drum labels

Note that soaps, solvents, and rinse waters used for decontamination must not be reused, and must be containerized after use. These materials will be treated as IDW. See Section 4.2.2 for proper handling and disposal of these materials.

4.2 Procedures

4.2.1 Decontamination

Decontamination procedures in this section are intended for use by field personnel for cleaning sampling, drilling and other environmental investigation and remediation equipment in the field.

4.2.1.1 Water Quality Meter and Water Level Meter / Interface Probe

All water quality meters and water level meters will be decontaminated by rinsing thoroughly with distilled or deionized water prior to each use. Water level meters having visible product (i.e., non-aqueous phase liquid, NAPL) must be scrubbed with soap, rinsed with generous amounts of tap water, then deionized water before use.

4.2.1.2 Groundwater Sampling Equipment (Non-Dedicated Pumps)

This procedure is for non-dedicated groundwater sampling equipment used for the low-flow purging and sampling technique (i.e., submersible pump).

The non-dedicated groundwater pumps must be decontaminated prior to sampling each well. The pump will be decontaminated by pumping fluids through them as follows:

1. Flush the pump with potable water to remove any sediment that may be trapped in the pump.
2. Flush the pump with a weak, non-phosphate detergent solution (approximately 5 gallons).
3. Flush the pump with tap water to remove all the detergent solution. Generous amounts of tap water (at least 5 gallons) should be used to ensure that detergent and any sediment that may be trapped in the pump does not remain in the pump.
4. Flush the pump with 1 to 2 gallons of distilled water.
5. Decontamination water should be containerized in buckets or drums for proper disposal.

4.2.2 IDW handling

IDW generated during field activities at the site may include: decontamination water, purge and well development water, personal protective equipment (PPE), and disposable sampling equipment. Each type of IDW will be handled as described below:

- ***Decontamination Water*** – decontamination water will be collected in buckets or drums for later discharge to on-Site sanitary sewers.
- ***Purge and Well Development Water*** – purge and well development water will be discharged to the ground in the vicinity of the well and allowed to infiltrate.
- ***PPE*** – used PPE and disposable sampling equipment (e.g., gloves, sample wipes, sample containers, etc.) will be collected and disposed of appropriately.

5.0 FIELD DOCUMENTATION

The following section provides general guidance for documentation of significant site activities during scheduled field work.

5.1 Equipment and Supplies

Equipment and supplies typically required for this procedure include, but are not necessarily limited to:

- Field notebooks
- Waterproof pens and indelible markers
- Camera
- Golder field forms (e.g., groundwater collection form, soil boring log, instrument calibration forms) and laboratory field forms (e.g., chains of custody documents)

5.2 Procedures

5.2.1 Field Notebooks

All significant field activity information must be recorded in a standard engineering hardbound field book that is dedicated to the project and has been sequentially numbered and paginated. All field notes must be written with a waterproof pen or indelible marker, and all entries must be legible. Any errors must be crossed out with a single line and initialed.

Field notes for each work day should, at a minimum, contain the following information:

- Date
- Project or site name
- Time of each data entry
- Description of work being performed that day
- Names and affiliations of personnel at location
- Weather conditions on site
- Location and type of activity
- Visual observations
- Pertinent field data (and any other measurements)
- Serial numbers, if any, on seals, transportation cases, and equipment
- Photographs taken, including date, time, direction faced, description of subject or activity
- Name and signature of note taker

Sample information must be summarized in the field notebook and/or appropriate field forms (see below).

At the completion of the event, the field notebook must be filed in the project files.

5.2.2 Photographs

Some sites may not allow photographs or may have restrictions – check with the Project Manager and/or client representative before taking any photographs. If photographs are taken, the site location, time, date, general direction faced, and brief description of the subject must be documented in the field book. If a digital camera is used, verify that the correct date and time are recorded for each photo.

5.2.3 Field Forms

5.2.3.1 Sampler Field Forms

Sampler field forms may include sample collection forms, instrument calibration forms, soil boring logs, test pit logs, well construction logs, air monitoring logs and similar forms. Much of the information documented on a field form does not need to be repeated in the field book. However, sample point identification and sample time must be documented in the field book, even if supplemental field forms are used.

Sampler field forms typically require:

- Name of sample point
- Site name, location and project number
- Name of persons collecting the samples
- Field instrument type, serial number and calibration time
- Description of samples taken
- Field measurements and units
- List of analytical parameters
- Method of sample collection
- Date and time of sample collection
- Any factors that may affect sample quality

Once the event is completed, the field forms are to be consolidated and archived in the project file.

5.2.3.2 Laboratory Field Forms

Laboratory field forms typically include a chain of custody (COC) for samples collected in the field. COC forms must accompany any environmental samples at all times. The COC form is typically pre-printed by the analytical laboratory, and should include:

- Sample identification number and matrix
- Project or site name or number
- Sampler's name or initials
- Sample collection date and time (military time format)

- Designation as a grab or composite sample
- Requested analysis
- Any special comments (i.e., samples will be filtered by laboratory upon receipt)
- Any preservatives added to the sample

When shipping samples to the laboratory, sample bottles and requested analyses should be noted on the COC form. The field team leader is responsible for sample handling and documentation requirements. One member of the sampling team should sign the COC form relinquishing custody to the laboratory. If using an overnight courier service, record the tracking number on the COC. The COC form should be sealed inside the shipping container with the samples. The paperwork should be sealed inside a plastic bag to prevent damage from water condensation. The courier does not need to sign the COC form if it is sealed within the shipping container using custody seals. Once samples are transported to the analytical laboratory, custodial responsibility is transferred to the laboratory.

There may be other laboratory field forms depending upon the sample media and/or project, laboratory or regulatory agency requirements.

6.0 SAMPLE HANDLING, CUSTODY, AND SHIPMENT

The following section provides general guidance for sample handling, identification, custody, and packaging and shipment. It describes procedures applicable to environmental samples of groundwater, surface water, and stormwater.

6.1 Equipment and Supplies

Equipment and supplies typically required for this procedure include, but are not necessarily limited to:

- Eye protection
- Latex and/or nitrile gloves
- Sample bottles, including preservatives as necessary
- Waterproof marking pen
- Sample bottle labels
- Field forms (e.g., groundwater collection form, soil boring log, instrument calibration forms) and laboratory field forms (e.g., chains of custody documents)
- Cushioning material (e.g., bubble wrap, foam, vermiculite, etc.)
- Sample cooler with ice
- Transparent tape
- Laboratory contact information
- Air carrier (e.g. FedEx) address label
- A secure (locked) vehicle or building

6.2 Procedures

6.2.1 Sample Handling

The following general procedures must be observed when handling samples:

- Sample containers, provided by the analytical laboratory, will be kept closed until the time they are to be filled. After filling, the containers will be securely closed, residue wiped from the sides of the containers, and immediately placed in a cooler with ice.
- Samples requiring chemical preservatives must be collected in pre-preserved containers obtained from the laboratory. Preservation procedures and analytical holding times must be conducted in accordance with the project analytical methods.
- Samples must be cooled to approximately 4°C immediately after collection. This temperature should be maintained for samples during storage and shipment to the laboratory.
- Samples must be shipped to the laboratory via overnight courier.

6.2.2 Sample Identification

All samples shall be adequately marked for identification from the time of collection and packaging through shipping and storage. If necessary, the labels shall be secured with clear tape. Sample identification shall include, as a minimum:

- Project name and/or code
- Sample identification number
- Analysis requested
- Chemical preservatives
- Sample date and time
- Initials of the individual performing the sampling (samples for chemical analysis)

Each sample must be assigned a unique sample identification (ID) number to be recorded on the sample label. Each sample ID number will be recorded in the field notebook, a Sample Field Information Form and, as applicable, on chain of custody documentation.

6.2.3 Sample Custody

Chain of Custody (COC) procedures have been established to ensure sample traceability from the time of collection through completion of analysis.

1. The National Enforcement Investigations Center (NEIC) of USEPA considers a sample to be in custody under the following conditions:
2. It is in your possession; or
3. It is in your view after being in your possession; or
4. It was in your possession and you locked it up; or
5. It is in a designated secure area.

6.2.3.1 Field Sample Custody

Samples and sample containers must be kept under proper COC during field sampling. If custody of the samples (and sample bottles) is exchanged during field sampling, such transfer must be documented on the COC form. The departing field staff should sign indicating the custody has been relinquished, and the arriving field staff should sign indicating responsibility for the custody of the samples. The COC form and field notebook (and/or field information form) should include:

- Sample identification number and matrix
- Project or site name or number
- Sampler's name or initials
- Sample collection date and time (military time)
- Designation as a grab or composite sample

- Requested analysis
- Any special comments
- Any preservatives added to the sample.

When shipping samples to the laboratory, all sample bottles and requested analyses should be noted on the COC form. Where multiple analytical methods are available for a particular analysis, the specific method number should be listed on the COC form.

One member of the sampling team should sign the COC form relinquishing custody to the laboratory. If using an overnight courier service, record the tracking number on the COC. The COC form should be sealed inside the shipping container with the samples. The paperwork should be sealed inside a plastic bag to prevent possible damage from water condensation, ice melt, or sample bottle breakage. The courier does not need to sign the COC form if it is sealed within the shipping container using custody seals. If the samples are hand delivered to the laboratory by field staff, the COC form should be signed at the laboratory when the samples are delivered. In such cases, the shipping container (sample cooler) does not need to be sealed as long as it is kept under proper COC until delivered to the laboratory. COC seals should be signed and dated, and the serial numbers listed on the COC form. At least two seals should be used on each shipping container.

6.2.3.2 Laboratory Custody

Once samples are transported to the analytical laboratory, custodial responsibility is transferred to the Laboratory Sample Manager to assure that the procedures presented in the laboratory's Quality Assurance Plan (QAP) and the appropriate analytical methods are followed. The laboratory QAP will contain a detailed description of the laboratory COC procedures, including receipt of samples, designation of a sample custodian, custody within the laboratory and laboratory storage, and disposal procedures.

6.2.4 Sample Packaging and Shipment

The following procedure is to be used to ship samples to the laboratory:

- Samples should be packed in a laboratory provided sample cooler in a manner that will minimize potential breakage of sample bottles. Bottles should be placed upright, and cushioned from other bottles with foam, bubble wrap, polystyrene chips, vermiculite, or similar inert materials.
- Wet ice (as opposed to blue ice in plastic containers) will be used for preservation. The wet ice must be placed in sealed storage bags to minimize the chance for water leakage. The coolers must contain enough wet ice to maintain a temperature of 4°C during transport to the laboratory.
- A temperature blank must be placed in each cooler being returned to the laboratory.
- Samples known or expected to be from highly impacted areas should be shipped separately from samples collected from areas of known or expected low impact areas to

minimize the chances of cross contamination. Samples of different matrices (i.e., soil and water) must be shipped separately with separate COCs.

- Samples transported to the laboratory by overnight courier must be sent "Priority Overnight". Field staff will ensure that the Saturday Deliver option is clearly marked for samples shipped on Friday.
- Air carrier shipment forms will be completed legibly with a waterproof pen.

7.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) SAMPLES

In addition to the primary samples described above, the following Quality Assurance/Quality Control (QA/QC) samples will be collected to help achieve the data quality goals or objectives for the project:

- Temperature blank – used to determine shuttle or cooler temperature
- Field rinsate blanks will be collected for all required analyses at a frequency of one per day per type of decontamination event where non-dedicated equipment is used. Field rinsate blanks are prepared in the field using lab supplied demonstrated analyte free water. The water is poured over and through each type of sampling equipment and submitted to the laboratory for analysis of target analytes.
- Field duplicates will be collected for all required analyses at a frequency of one per 20 primary samples per matrix. Field duplicates are collected by sampling the same location twice, but the field duplicate is assigned a unique sample identification number.
- MS/MSD samples will be collected for all required analyses at a frequency of one per 20 primary samples per matrix. Additional sample volume is collected from a location and submitted to the laboratory for analysis. The laboratory will use the additional volume to prepare spiked samples to assess accuracy and precision.

8.0 REPORTING AND RECORD KEEPING REQUIREMENTS

8.1 Monitoring Reports

Monitoring reports will be provided to the PADEP annually, by March 31th of each year. The report will include the following information:

- A tabulation of historical monitoring data provided in both paper and electronic format.
- Time trend plots of water level and chemical data for the groundwater, surface water and storm water data.
- Groundwater contour maps for both the spring and fall sampling events using data from the wells.
- Dual y-axis time trend plots comparing individual contaminant concentrations for arsenic, lead, and manganese to water levels for monitoring wells MW-S1, MW-S11, MW-S13, MW-S6, and MW-S14.
- A discussion of any problems encountered during the field work, deviations from the sampling procedures or problems with QA/QC procedures.
- A discussion of the ground, surface water and stormwater monitoring results, including whether the results indicate a potential contaminant release from the landfill to groundwater or surface water.
- Recommendations for modifications to the monitoring program.

8.2 Well Installation/Abandonment Notification

Trinity shall notify PADEP at least 15 days prior to installing or abandoning any monitoring wells. The installation of new monitoring wells or abandonment of existing monitoring wells shall be performed in accordance with applicable PADEP regulations.

8.3 Recordkeeping

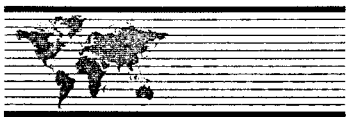
The following records will be maintained by Trinity and made available to PADEP upon written request until the end of the post-closure care period:

- Field notes from the previous years' sampling
- Laboratory data sheets and associated chain-of-custody documentation
- Electronic data deliverable (EDD) from the laboratory including at a minimum: laboratory name, facility name, sample number and associated sample location, sampling date, date analyzed, parameter, result, laboratory qualifiers, reporting limit, method detection limit, dilution factors and analytical methods, etc.

9.0 HEALTH AND SAFETY PROCEDURES AND TRAINING REQUIREMENTS

Persons performing groundwater, surface water and/or storm water sampling will be required to follow general health and safety protocols of Trinity, and 40 CFR 1910.120.

In general, risks associated with the sampling activities are considered to be low for trained personnel. Training for sampling personnel shall include review of this sampling plan, review of Trinity's Safety Procedures Manual, and review of the sampling protocols.



APPENDIX I - RESPONSIVENESS SUMMARY

REVISED CLEANUP PLAN SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

Prepared For: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

February 2013

Project No. 073-6009-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Attachments

INTRODUCTION

In accordance with the September 2010 Public Involvement Plan (PIP) for the South Plant Site (Site), Trinity Industries Inc. (Trinity) placed copies of the draft Cleanup Work Plan, draft Cleanup Plan, and draft Revised Cleanup Plan in local repositories for public review, published notices of their availability for public comment, and solicited comments on the documents. The public notice for the draft Cleanup Work Plan was published in the Greenville Record Argus on April 25, 2011 and the Sharon Herald on April 26, 2011 and the public comment period for this document ended on May 23, 2011. The public notice for the draft Cleanup Plan was published in the Greenville Record Argus on November 4, 2011 and the Sharon Herald on November 6, 2011 and the public comment period for this document ended on December 5, 2011. The public notice for the draft Revised Cleanup Plan was published in the Sharon Herald on January 22, 2013 and the public comment period for this document ended on February 22, 2013.

In addition, Trinity held a public meeting at Greenville High School on May 4, 2011 to discuss the results of the draft Cleanup Work Plan for the Site. At the meeting, Trinity and its consultant, Golder Associates Inc. (Golder), gave a 60 minute overview of the draft Cleanup Work Plan including a summary of the sampling results, the constituents of concern (COCs) being addressed, the proposed cleanup standards/response actions, and the next steps in the cleanup process. The presentation was followed by a question and answer session. A copy of the agenda that was handed out at the meeting is included as Attachment A.

The following responsiveness summary presents all comments/questions made at the meeting, submitted in writing to the Trinity Public Involvement Coordinator (PIC), or posed through the toll-free 800 number, as well as responses to those questions.

SECTION 1 – Q & A FROM THE PUBLIC MEETING FOR THE DRAFT CLEANUP WORK PLAN

1. In the presentation you mentioned several acronyms that I am not familiar with. What do TCLP and SHS stand for?

TCLP stands for toxicity characteristic leaching procedure. It is an analytical method that is used to determine if a waste stream is characteristically hazardous and how it should be managed or disposed of in accordance with federal and state regulations.

SHS stands for Statewide Health Standards. The SHS are Pennsylvania's human health risk-based cleanup standards. Another acronym that goes along with SHS is MSC or medium-specific concentrations (MSCs) and they are part of the SHS. The MSCs were last updated on January 8, 2011. They are updated by the Pennsylvania Department of Environmental Protection (PADEP)

periodically based on new information on risk. The latest updates were based on a new United States Environmental Protection Agency (USEPA) methodology for calculating risk.

2. In the presentation, we heard four more months until further action after PADEP approves. Is that correct?

Yes. After PADEP approval it will take approximately four months to perform pre-design investigations, engineering design, and preparation of the Cleanup Plan or final design.

3. Did PADEP tell Trinity that within the next 60 days that they will be mandating all municipalities to adopt a stormwater management ordinance that states that municipalities will be responsible for reviewing/approving stormwater management plans for all projects with impermeable surfaces over 5,000 square ft.

We had not heard that the review/approval authority had been delegated to the municipalities; however, we were aware that there are stormwater/erosion control requirements and had planned on preparing a stormwater management plan for review by the Mercer County Soil Conservation District and the PADEP as part of the permitting process for the project. The stormwater management plan will include the design details/controls for managing runoff at the Site during and after the completion of construction activities. Based on the new mandate, we will work with the municipalities to ensure that this management plan complies with the requirements of the stormwater management ordinance.

4. You indicated that there would be a grass type cap on the disposal area. Is that correct?

There will be a multi-level cap on the disposal area. The layers would include clay or geosynthetic impermeable layer(s) on top of the waste, followed by a drainage layer, protective cover soil, and a vegetative/grass layer on top to prevent erosion.

5. Jim Lowry of the Greenville Area Economic Development Corporation asked if he could get a copy of the presentation.

Yes. We will send an electronic copy via email after the meeting. (Note: A copy of the presentation was emailed to Jim Lowry on May 17, 2011.)

SECTION 2 – WRITTEN QUESTIONS FROM THE PUBLIC

There were no written questions submitted to Trinity during either the public comment period for the draft Cleanup Work Plan, the draft Cleanup Plan, or for the draft Revised Cleanup Plan.

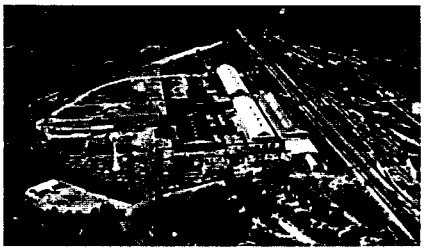
SECTION 3 – QUESTIONS FROM THE TOLL FREE LINE

There were no calls to the toll free hotline regarding the draft Cleanup Work Plan, the draft Cleanup Plan, or for the draft Revised Cleanup Plan.

ATTACHMENT A

HANDOUT AGENDA – MAY 4, 2011 PUBLIC MEETING FOR CLEANUP WORK PLAN

PUBLIC MEETING
CLEANUP WORK PLAN
TRINITY SOUTH PLANT



Date May 4, 2011

Time 6:30 PM to 9:30 PM

Location Greenville High School
Lecture Hall
9 Donation Road
Greenville, PA 16125

Basis Trinity Industries, Inc., (Trinity) is performing response actions at the South Plant and North Plant Sites in Greenville, Pennsylvania. As required by Land Recycling and Environmental Remediation Standards Act (Act 2), Trinity developed a Public Involvement Program with input from the Borough of Greenville and Hempfield Township. This program calls for public comment periods and public meetings to provide opportunities for interested parties to provide input to the various phases of the cleanup process, including, but not limited to, the Remedial Investigation (RI) Report, the Cleanup Plan, and the Final Report.

Objective Review the Cleanup Work Plan for the South Plant and solicit comments from the public.

Agenda

Topics	Speaker(s)	Duration
Introductions and Opening Remarks	Dennis Lencioni	5 min
Review Meeting Agenda & Protocols	Pete Swinick	5 min
Cleanup Work Plan Overview	Joe Gormley	20-30 min
Questions/Answer/Statement Session	Trinity & Golder	30-45 min
Closing	Dennis Lencioni	5 min

Follow-up

Document Repositories	Phone Numbers
Borough of Greenville	724-588-4193
Hempfield Township	724-588-5032

Additional Questions and Comments — Toll Free Hotline - 800-447-6965

Additional Written Comments — Trinity Public Involvement Coordinator
C/o Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane Conshohocken, PA 19428

APPENDIX J

ADDITIONAL GROUNDWATER SURFACE WATER MONITORING RESULTS

APPENDIX J – SUPPLEMENTAL GROUNDWATER AND SURFACE WATER MONITORING RESULTS

REVISED CLEANUP PLAN SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

Prepared For: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

January 2013

Project No. 073-6009-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Tables

List of Figures

List of Attachments

1.0 INTRODUCTION AND BACKGROUND

On behalf of Trinity Industries, Inc. (Trinity), Golder Associates Inc. (Golder) has prepared this summary report of the scope of work for and associated findings from additional groundwater and surface water monitoring performed during 2012 at the South Plant Site (Site). These field investigations were designed and completed consistent with the discussions and agreements made during a June 1, 2012 meeting between representatives from Trinity, Golder and the Pennsylvania Department of Environmental Protection (PADEP). The items discussed in that meeting were documented by Golder in the letter *Response to Comments, Cleanup Plan - South Site - Disapproval* (Response Letter) submitted to the PADEP on July 2, 2012.

On November 27, 2012, PADEP sent Trinity the letter *Conference Call Summary for South Plant Cleanup Plan*. This letter from PADEP "summarized the conference call and additional measures required to resolve remaining concerns." In particular, the letter presented PADEP's position on the responses provided in the July 2, 2012 Response Letter including approving the proposed field activities that were implemented under the scope of work discussed in this report.

The work described herein is consistent with commitments made in the Response Letter and was performed in general accordance with requirements of both the Consent Order and Agreement (COA) executed by the Commonwealth of Pennsylvania on December 21, 2006 and the Land Recycling and Environmental Remediation Standards Act (Act 2).

On March 1, 2010, on behalf of Trinity, Golder submitted the *Revised Remedial Investigation (RI) Report, South Plant* (RI Report, Golder 2010). The investigation work compiled in the RI Report was conducted in general accordance with the *Final Revised Remedial Investigation Work Plan, North and South Plants* (RI Work Plan, Golder 2007).

The RI Report presented the results of field investigations for Constituents of Concern (COCs) in soil, groundwater, surface water, sediments, and Site stormwater drainage. COCs included metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). A summary of Site COC exceedances by Area of Concern (AOC) is shown in Table 2-1 of the Cleanup Plan (Golder 2012).

In the Site soils, the primary COC at the Site, in terms of concentration and extent of exceedances, is lead. Sources for lead in soils include surface and subsurface soils in the former disposal areas (AOC-S1 - Old Ballfield; AOC-S11 – Miscellaneous Debris/Fill Area; and AOC-S17 – Sand Disposal Area) and former operations areas as well as surface soils in drainage ditch/surface water pathway areas.

In the Site groundwater, the primary COCs are inorganics (arsenic, lead, and manganese). Dissolved manganese was the only inorganic in groundwater with exceedances in wells for all groundwater

monitoring events. However, sources of dissolved manganese in groundwater are believed to be dissolution of manganese from area soils due to reducing conditions in off-Site and on-Site areas.

Based on the findings presented in the RI Report, the *Cleanup Work Plan, South Plant Site* (Golder 2011) was submitted to PADEP on June 7, 2011. It proposed Response Actions for soils, surface water and groundwater to address impacts at, and potentially migrating from, the Site.

On January 30, 2012 on behalf of Trinity, Golder submitted the *Cleanup Plan, South Plant Site* (Cleanup Plan) to the PADEP. The objective of the Cleanup Plan was to obtain approval from the PADEP for the design of selected Response Actions at the Site. On April 27, 2012, the PADEP sent a letter to Trinity with comments disapproving the Cleanup Plan. In particular, the letter included the following comments related to groundwater and surface water:

- Comment No. 5 - Because the Cleanup Plan proposes to leave waste in place below the water table, in order for the Department to approve this approach, Trinity must perform surface water sampling to ensure that the waste material is not currently impacting Mathay Run and the Old Erie Canal above Chapter 16 and Chapter 93 surface water criteria. Samples taken from Mathay Run and the Old Erie Canal should be collected during both low flow periods and after storm events to evaluate the impact of diffuse flow of groundwater to the streams during these conditions. Sampling points should be appropriately stationed where the impacts of groundwater to surface water would be most apparent (i.e. disposal areas adjacent to the stream). The results from the sampling should be included in the revised Cleanup Plan.
- Comment No. 7 - The 2011 "Clean Up Work Plan-South Site" concluded that sediments impacted above the United States Environmental Protection Agency, Region 3, Biological Technical Assistance Group, Freshwater Sediment Screening Benchmarks, may be site related (detections of contaminants found in sediments correlate to AOC-S3 for lead, manganese, and zinc), Trinity now concludes in the Cleanup Plan that the impacts to sediments are not `site-related' and are likely related to off-site impacts. However, Trinity had a National Pollutant Discharge Elimination System (NPDES) permit (No. PAR808323) for discharge to Erie Extension Canal for Outfalls No. 1, No. 2, and No. 3. It is noted on the NPDES application that these outfalls drained approximately 55 acres of the facility to the Erie Extension Canal. Additionally, Trinity Industries-North Plant Site's stormwater discharges into the Old Erie Canal, as noted by Trinity in their "Response to Comments & Revised RI Report-North Plant" letter dated September 2, 2011. Therefore, Trinity will need to address the sediment impacts in accordance with 25 Pa. Code §§250.311 and 250.402, as well as the guidance provided in Section IV.H of the Land Recycling Technical Guidance Manual.
- Comment No. 9 - Monitoring wells MW-13 and MW-14 have only one water level measurement which was performed in September 2011. In addition, these monitoring wells had no sampling analysis conducted for Site Contaminants of Concern (COCs). Because these wells were installed after the submittal and subsequent approval of the Remedial Investigation Report, please refer to 25 Pa. Code §250.408(e) for the appropriate number of sampling events as these wells are being utilized for additional site characterization.
- General Comments - Trinity concludes that Mathay Run/Old Erie Canal is a hydraulic barrier which intercepts all groundwater contamination leaving the site; thus, preventing groundwater contamination off-site. However, data should be provided in the report to

support this conclusion. At a minimum, Trinity should evaluate this conclusion by providing the following: I) Two quarterly groundwater samples and elevations from MW-13 and MW-14 for site COCs; 2) Concurrent samples and elevations obtained from monitoring wells adjacent to MW-12 and MW-13; 3) Concurrent stream gauge measurements should be obtained; and 4) Concurrent stream samples (for site related COCs) should be collected.

On June 1, 2012, Trinity and Golder met with PADEP in its Meadville, PA offices to present preliminary responses, and agree to a path going forward for revising the Cleanup Plan for PADEP approval. As a follow up to the meeting, Golder sent the Response Letter on July 2, 2012 (discussed above) that addressed PADEP's comments on the Cleanup Plan. In response to PADEP Comment Nos. 5 and 9, as well as the General Comments, the Response Letter included, but was not limited to, the following proposed Site field investigation activities, the results of which are provided in this report:

- Install one additional monitoring well
- Install one additional staff gauge
- Perform two additional groundwater monitoring events
- Perform two additional surface water monitoring events, one representing low flow conditions and the other after a storm event

In response to PADEP comment No. 7, the Response Letter also stated that further sampling would be performed if PADEP provided information that clearly confirmed a stormwater pathway from the Site to the Old Erie Canal. As a follow up to the June 1, 2012 meeting, PADEP visited the Site and Trinity performed several additional investigations of the Site storm sewer system. Those additional investigations demonstrated that there is no direct pathway from the Site stormwater drainage system to either the Old Erie Canal or Mathay Run. These results are discussed in a separate report entitled Stormwater Drainage System Investigations, which is included as an Appendix to the Revised Cleanup Plan.

2.0 SCOPE OF WORK

A field program that was developed to address the above listed investigation activities is described in the following subsections. Figure 1 presents the locations of the additional field investigations. The field procedures were performed in general accordance with the RI Work Plan. Investigation-derived waste (IDW) was placed into 55-gallon steel drums with lids, labeled, and stored in a staging location on-Site for characterization and future disposal.

2.1 Monitoring Network

The Site monitoring network subject to this scope of work is presented on Figure 1 and consisted of the following:

- Fifteen on-Site groundwater monitoring wells (MW-S1 through MW-S15), including the recently installed well described below
- Four staff gauges (SG-S1 through SG-S4) in both the Old Erie Canal and Mathay Run, including the recently installed gauge described below
- Six surface water sampling locations (SW-S1 through SW-S6) in both the Old Erie Canal and Mathay Run

The network of groundwater monitoring wells for the Site also currently includes three off-Site wells on the Canadian National Railway (CN) property to the west of the Site (i.e., MW-CN1, MW-CN2, and MW-CN3). At the time of these field investigations, access to the wells was not available. However, due to their distance from the Mathay Run and considering the previous data from these wells, the omission of water level data from these wells is not considered a meaningful data gap and should not impact the interpretation of groundwater flow in the vicinity of the Mathay Run.

Table 1 presents construction details for the site monitoring network.

2.2 Installation of Additional Monitoring Locations

In accordance with the Response Letter, Golder supervised the installation of the following two additional monitoring locations to support the assertion in the RI Report that Mathay Run acts as a hydraulic barrier:

- MW-S15 – a shallow groundwater monitoring well screened across the water table, located across Mathay Run from the former disposal areas and MW-S6
- SG-S4 – a staff gauge in Mathay Run, located towards the downstream property boundary

After installation, these two locations were surveyed by Howells and Baird, Inc., a Pennsylvania-licensed surveyor. These new locations are shown on Figure 1 and construction details are provided on Table 1.

2.2.1 New Monitoring Well

Well MW-S15 was installed on September 5, 2012 by the Pennsylvania-licensed driller SJB Services, Inc. (SJB). During installation of this 2 inch PVC well, soil samples were collected for visual observation using a split-spoon sampler. Observations of the well installation, including construction details and soil descriptions, were documented on a field boring log. The boring log was converted to an electronic gINT® log and is provided in Attachment A.

This well was installed on a wooded parcel of Site property across Mathay Run from the main property. Accessing this area with drilling equipment was extremely difficult because there are no roads and the creek banks are relatively steep in the area. In addition, access from adjacent properties would have required a legal agreement and extensive site clearing. Because of these access limitations, SJB hand-carried equipment across the creek and installed MW-S15 using a drive hammer mounted on a tripod with a motorized winch.

On the day following completion of construction, the well was developed using a hand bailer to remove over eight well volumes of water until turbidity was reduced in the purged water.

2.2.2 New Staff Gauge

Staff gauge SG-S4 was installed on September 10, 2012 by Howells & Baird. The gauge was 3.33 feet in length and had 0.02-foot increments. It was attached to a metal rod that was driven approximately two feet into the base of the flow channel in the stream. The 0.00-foot gradation on the gauge was set near the bottom of the stream.

On the same day, Howells & Baird reset the metal rod of staff gauge SG-S3. This gauge had shifted from a vertical alignment. Gauges SG-S1 and SG-S2 were also inspected at this time; however, they did not need to be repaired. Following the repair to SG-S3, Howells & Baird surveyed all four staff gauges in the monitoring network.

2.3 Monitoring Events

Two monitoring events for water level measurements and both groundwater and surface water sampling were performed on the following dates:

- September 25 through 27, 2012
- November 6 and 8, 2012

The September monitoring event represented the storm event sampling since those samples were collected during precipitation on September 26, 2012. The rainfall started approximately three hours before the surface water sampling was initiated, with a reported precipitation of greater than 0.3 inches at that time. The rainfall information was obtained from the National Oceanic and Atmospheric

Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/) for the nearest NOAA weather station located in Meadville, Pennsylvania, approximately 20 miles from the site. A discussion about stream water levels during this monitoring event is provided in Section 3.3.

The November monitoring event represented a lower-flow surface water sampling event. Those samples were collected six days after the most recent storm event of greater than 0.1 inch of precipitation on November 2, 2012. While there was precipitation of less than 0.1 inch per day on November 3-6, 2012, there was no recorded precipitation on November 7 or November 8, 2012 and surface water sampling was performed on November 8. It should be noted that this event was originally scheduled for week of October 29, but was rescheduled due to Hurricane Sandy.

2.3.1 Water Levels

On the first day of each monitoring event, synoptic water levels were measured at both the fifteen on-Site wells and the four staff gauges. The measurements were made prior to disturbance of the water levels by the sampling equipment.

2.3.2 Groundwater Sampling

For the September 2012 event, samples were collected from the following six wells in the vicinity of the former disposal areas, Mathay Run, and the Old Erie Canal:

- MW-S5
- MW-S6
- MW-S11
- MW-S13
- MW-S14
- MW-S15

For the November 2012 event, samples were collected from a total of eight wells, including the above listed six wells and both MW-S1, which is adjacent to the former disposal areas, and MW-S4, which is adjacent to the Old Erie Canal at the up-gradient portion of the Site.

For both monitoring events, groundwater samples were obtained using low-flow sampling techniques in general accordance with the RI Work Plan. Water levels were measured in each well prior to installing the sampling pump and then during purging. Field parameters were measured during purging using a calibrated field meter and flow-through cell. These measurements were recorded on field forms. Quality control samples for field duplicates, matrix spikes, and equipment blanks from a sampling pump were also collected in accordance with the RI Work Plan.

The groundwater samples were submitted to TestAmerica Laboratories, Inc. (TestAmerica) for analysis for arsenic, lead, and manganese (total and dissolved) by USEPA SW-846 Method 6020. The samples for dissolved analyses were field-filtered with 0.45 µm in-line, disposable filters prior to field preservation with nitric acid.

2.3.3 Surface Water Sampling

For both the September and November 2012 events, samples were collected from the following six surface water locations:

- Mathay Run locations
  - SW-S1
  - SW-S2
  - SW-S3
- Old Erie Canal locations
  - SW-S4
  - SW-S5
  - SW-S6

For both monitoring events, grab samples were obtained by directly filling the sample bottles from the surface flow of the water body. While the sample bottles were being filled, field parameter readings were measured by placing the meter probes into the water body slightly downstream of the sample collection location. Quality control samples for field duplicates and matrix spikes were collected in accordance with the RI Work Plan.

The surface water samples were submitted to TestAmerica for analysis of arsenic, lead, and manganese (total and dissolved) by USEPA SW-846 Method 6020. The samples for dissolved analyses were filtered by the laboratory, thus they were submitted without the addition of nitric acid as a field preservative.

3.0 RESULTS AND DISCUSSION

3.1 Water Levels

The measured water levels from September and November 2012 events are presented in Table 2 for the groundwater wells and Table 3 for the staff gauges. These tables also include historic measurements by Golder at the Site. The tables provide water level elevations that have been calculated using surveyed measuring points at each location.

Figure 2 presents the inferred groundwater contours for the Site from the September and November 2012 events, as well as four contour maps that correspond with previous groundwater sampling events (i.e., March 2008, April 2008, March 2009, and May 2009). Other synoptic water level measurements have been made at the Site with associated contour maps presented in the RI Report and Cleanup Plan.

The contours shown on Figure 2 are relatively consistent from event to event. It should be noted that the 2008 and 2009 contours have been updated from those presented in the RI Report to reflect the inferred influence of the Borough of Greenville's 24-inch storm sewer on groundwater flow at the Site.

The following comments are based on the water level data measured at the Site and presented on Figure 2:

- SG-S1 – In March and May 2009, surface water levels at this Old Erie Canal location were lower than the water levels in nearby well MW-S4 indicating that the Old Erie Canal is a gaining stream.

  In 2012, however, the flow appeared to have reversed with observed surface water levels at SG-S1 both higher than those in MW-S4 and lower than the levels observed at downstream staff gauge SG-S2, indicating that water was backing up downstream. However, these observations coincided with Golder's observations in September 2012 that beavers were starting to build a dam across the Old Erie Canal at its confluence with Mathay Run. During the November 2012 sampling event, the dam was observed to be more substantial.
- SG-S2 – Surface water levels at this Old Erie Canal location were consistently below nearby well MW-S5 and more distant well MW-S8. The mounding of groundwater observed in the vicinity of these wells is likely attributed to a broken storm drain that was identified during the November-December 2012 stormwater drainage system investigations. These water levels indicate that the Old Erie Canal is a gaining stream.
- SG-S3 – Surface water levels at this Mathay Run location (just downstream of the confluence with the Old Erie Canal) were typically lower than nearby, and somewhat downstream, well MW-S6. The exception shown on Figure 2 was for September 2012 when surface water flow was elevated due to a storm event. Since the Mathay Run water levels were typically below the groundwater level measured in MW-S6, Mathay Run is considered to be a gaining stream, and acts as a groundwater divide in this area.
- SG-4 - Water levels at this recently installed staff gauge in Mathay Run were lower than those observed in nearby wells MW-S11 and MW-S13. Water levels in MW-S13 have been observed higher than MW-S11. Since the Mathay Run water level was below the

aquifer water level measured in the nearby wells, this water body is considered to be a gaining stream, and acts as a groundwater divide in this area.

The water level data measured in the vicinity of the former disposal areas are consistent with the assertion that Mathay Run is a hydraulic barrier, preventing COCs in groundwater from reaching areas on the other side of the creek.

3.2 Groundwater Results

Field parameters measured during the September and November 2012 groundwater sampling events are presented in Tables 4 and Table 5, respectively. They show the initial water levels measured prior to sampling pump placement and the final (i.e., stabilized) field parameter readings measured at the end of purging.

Following receipt of the chemical analysis results, Golder validated the data in accordance with the RI Work Plan. The groundwater results for total and dissolved metals were tabulated and compared to the Pennsylvania residential medium-specific concentrations (MSCs) for used aquifers with total dissolved solids (TDS) less than or equal to 2,500 mg/L (see Table 6). The laboratory analytical reports are provided in Attachment B.

In general, the groundwater analytical results for the September and November 2012 monitoring events were consistent with the previous RI results. A summary of the recent results is provided below:

- Arsenic
  - Dissolved results were below the MSC of 10 µg/L during both events for all but one well, MW-S6, which was slightly above the MSC
  - Total results were slightly above the MSC at up-gradient well MW-S4, and wells MW-S6, MW-S13, MW-S14 and MW-S15 during at least one of the events
- Lead
  - Dissolved results were below the MSC of 5 µg/L during both events for all wells
  - Total results were below the MSC during both events for all but two wells with slight exceedances: MW-S14 had a detection of 6 µg/L in September 2012 and MW-S15 had a detection of 6 µg/L in November 2012
- Manganese
  - Dissolved and total results were similar for each well during each event
  - Results were typically above the MSC of 300 µg/L
  - Only wells MW-S1, MW-S4, and MW-S5 had results below the MSC
  - Wells across Mathay Run (MW-S13 and MW-S15) had results above the MSC, but there was no apparent correlation with wells near the disposal areas (MW-S11 and MW-S6)
  - Wells with lower ORP values generally had the highest manganese concentrations

The observed correlation between higher manganese concentrations and low (e.g., negative) ORP values on both sides of a hydraulic barrier, Mathay Run, supports the RI Report assertion that manganese in soil is being mobilized by reducing conditions in groundwater resulting from the degradation of organic materials in floodplain soils (alluvium).

3.3 Surface Water Results

Field readings measured during the September and November 2012 surface water sampling events are provided on Tables 7 and 8, respectively. They present field parameter meter readings for both events. It is noted that turbidity readings were higher for the storm surface water sampling event (September 2012) compared to the lower-flow event (November 2012).

In addition, Table 7 (September 2012 event) presents surface water elevations calculated from staff gauge readings that were measured during surface water sampling. These elevations show that the stream levels were higher when compared to Site-wide water levels measured the previous day (see Table 3 and Sections 2.3.1 and 3.1) and the surface water gradient between SG-S3 and SG-S4 was steeper (0.0070 feet/foot compared to 0.0063 feet/foot) during sampling indicating a higher stream velocity and flow during the precipitation event.

Additional staff gauge measurements were not recorded during the November 2012 sample collection because there was less than 0.1-inch of precipitation between Site-wide water level measurements and surface water sampling. Therefore, the Site-wide synoptic measurements on November 6, 2012 are considered to represent stream levels for surface water sampling on November 8, 2012.

Following receipt of the chemical analysis results, Golder validated the data in accordance with the RI Work Plan. The laboratory analytical reports are provided in Attachment B. The surface water results for total and dissolved metals were tabulated (see Table 9) and compared to the Pennsylvania specific water quality criteria for manganese found in 25 PA Code §93.7 and the following Pennsylvania water quality criteria for toxic substances (see Table 9) found in 25 PA Code §93.8c for arsenic and lead:

- Criteria Continuous Concentrations (CCC) for fish and aquatic wildlife
- Criteria Maximum Concentrations (CMC) for fish and aquatic wildlife
- Human Health Criteria

Note that the manganese standard is applicable for potable water systems (PWS) and is listed in Table 9 under human health criteria.

The following discusses the chemical analysis results for the surface water samples collected during the September and November 2012 monitoring events:

- Arsenic
  - Dissolved and total results were below all applicable criteria during both events
- Lead
  - Dissolved results were below all applicable criteria during both events
  - Total results were above the CCC for each location during the storm sampling event (September 2012). In addition, one of the highest results was observed at SW-S3 (see Figure 1), which represents the background/upstream condition for Mathay Run
  - Total results were below the MCC for each location during both events
  - Total results were below all applicable criteria during for the lower-flow event (November 2012)
- Manganese
  - Dissolved and total results were below all applicable criteria during both events

Total lead was the only exceedance of any applicable criteria for the COCs in the surface water samples. However, these CCC exceedances were observed only during storm event sampling and in all locations including the background/upstream location for Mathay Run. Therefore, these lead exceedances appear to be related to urban stormwater runoff and not related to the Site. In summary, the surface water sampling did not show any impacts related to Site COCs resulting from either direct discharge from the Site or diffuse groundwater flow to the Old Erie Canal or Mathay Run.

4.0 CONCLUSIONS

The following conclusions and recommendations are based upon the results of additional groundwater and surface water sampling performed at the Site in September and November 2012:

- Conclusions
  - Water levels measured in the vicinity of the former disposal areas, the Old Erie Canal, and Mathay Run were consistent with the assertion in the RI Report that the Old Erie Canal and Mathay Run are gaining streams and are acting as a hydraulic barrier to off-Site transport of COCs in groundwater under low flow and storm flow conditions.
  - There is no correlation between groundwater concentrations in the vicinity of the former disposal areas and concentrations in wells across Mathay Run.
  - The observed correlation between higher manganese concentrations and low (e.g., negative) ORP values on both sides of a hydraulic barrier, Mathay Run, supports the RI Report assertion that manganese in soil is being mobilized by reducing conditions in groundwater resulting from the degradation of organic materials in floodplain soils (alluvium).
  - Total lead was the only exceedance of any applicable criteria for the COCs in the surface water samples including the background/upstream location for Mathay Run. Therefore, these lead exceedances appear to be related to urban stormwater runoff and not related to the Site.
  - There are no exceedances of ambient water quality criteria of Site related COCs in either the Old Erie Canal or Mathay Run resulting from either direct discharge or diffuse groundwater flow from the Site.
- Recommendations
  - No further groundwater or surface water investigations are necessary to determine the off-Site fate and transport of Site related COCs.

APPENDIX J – SUPPLEMENTAL GROUNDWATER AND SURFACE WATER MONITORING RESULTS

REVISED CLEANUP PLAN SOUTH PLANT SITE

Trinity Industries, Inc.
Greenville, Pennsylvania

Prepared For: Trinity Industries, Inc.
2525 Stemmons Freeway
Dallas, TX 75207

Prepared By: Golder Associates Inc.
Spring Mill Corporate Center
555 North Lane, Suite 6057
Conshohocken, PA 19428 USA

January 2013

Project No. 073-6009-100

A world of capabilities delivered locally

Golder Associates

Table of Contents

List of Tables

List of Figures

List of Attachments

1.0 INTRODUCTION AND BACKGROUND

On behalf of Trinity Industries, Inc. (Trinity), Golder Associates Inc. (Golder) has prepared this summary report of the scope of work for and associated findings from additional groundwater and surface water monitoring performed during 2012 at the South Plant Site (Site). These field investigations were designed and completed consistent with the discussions and agreements made during a June 1, 2012 meeting between representatives from Trinity, Golder and the Pennsylvania Department of Environmental Protection (PADEP). The items discussed in that meeting were documented by Golder in the letter *Response to Comments, Cleanup Plan - South Site - Disapproval* (Response Letter) submitted to the PADEP on July 2, 2012.

On November 27, 2012, PADEP sent Trinity the letter *Conference Call Summary for South Plant Cleanup Plan*. This letter from PADEP "summarized the conference call and additional measures required to resolve remaining concerns." In particular, the letter presented PADEP's position on the responses provided in the July 2, 2012 Response Letter including approving the proposed field activities that were implemented under the scope of work discussed in this report.

The work described herein is consistent with commitments made in the Response Letter and was performed in general accordance with requirements of both the Consent Order and Agreement (COA) executed by the Commonwealth of Pennsylvania on December 21, 2006 and the Land Recycling and Environmental Remediation Standards Act (Act 2).

On March 1, 2010, on behalf of Trinity, Golder submitted the *Revised Remedial Investigation (RI) Report, South Plant* (RI Report, Golder 2010). The investigation work compiled in the RI Report was conducted in general accordance with the *Final Revised Remedial Investigation Work Plan, North and South Plants* (RI Work Plan, Golder 2007).

The RI Report presented the results of field investigations for Constituents of Concern (COCs) in soil, groundwater, surface water, sediments, and Site stormwater drainage. COCs included metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs). A summary of Site COC exceedances by Area of Concern (AOC) is shown in Table 2-1 of the Cleanup Plan (Golder 2012).

In the Site soils, the primary COC at the Site, in terms of concentration and extent of exceedances, is lead. Sources for lead in soils include surface and subsurface soils in the former disposal areas (AOC-S1 - Old Ballfield; AOC-S11 – Miscellaneous Debris/Fill Area; and AOC-S17 – Sand Disposal Area) and former operations areas as well as surface soils in drainage ditch/surface water pathway areas.

In the Site groundwater, the primary COCs are inorganics (arsenic, lead, and manganese). Dissolved manganese was the only inorganic in groundwater with exceedances in wells for all groundwater

monitoring events. However, sources of dissolved manganese in groundwater are believed to be dissolution of manganese from area soils due to reducing conditions in off-Site and on-Site areas.

Based on the findings presented in the RI Report, the *Cleanup Work Plan, South Plant Site* (Golder 2011) was submitted to PADEP on June 7, 2011. It proposed Response Actions for soils, surface water and groundwater to address impacts at, and potentially migrating from, the Site.

On January 30, 2012 on behalf of Trinity, Golder submitted the *Cleanup Plan, South Plant Site* (Cleanup Plan) to the PADEP. The objective of the Cleanup Plan was to obtain approval from the PADEP for the design of selected Response Actions at the Site. On April 27, 2012, the PADEP sent a letter to Trinity with comments disapproving the Cleanup Plan. In particular, the letter included the following comments related to groundwater and surface water:

- Comment No. 5 - Because the Cleanup Plan proposes to leave waste in place below the water table, in order for the Department to approve this approach, Trinity must perform surface water sampling to ensure that the waste material is not currently impacting Mathay Run and the Old Erie Canal above Chapter 16 and Chapter 93 surface water criteria. Samples taken from Mathay Run and the Old Erie Canal should be collected during both low flow periods and after storm events to evaluate the impact of diffuse flow of groundwater to the streams during these conditions. Sampling points should be appropriately stationed where the impacts of groundwater to surface water would be most apparent (i.e. disposal areas adjacent to the stream). The results from the sampling should be included in the revised Cleanup Plan.
- Comment No. 7 - The 2011 "Clean Up Work Plan-South Site" concluded that sediments impacted above the United States Environmental Protection Agency, Region 3, Biological Technical Assistance Group, Freshwater Sediment Screening Benchmarks, may be site related (detections of contaminants found in sediments correlate to AOC-S3 for lead, manganese, and zinc), Trinity now concludes in the Cleanup Plan that the impacts to sediments are not `site-related' and are likely related to off-site impacts. However, Trinity had a National Pollutant Discharge Elimination System (NPDES) permit (No. PAR808323) for discharge to Erie Extension Canal for Outfalls No. 1, No. 2, and No. 3. It is noted on the NPDES application that these outfalls drained approximately 55 acres of the facility to the Erie Extension Canal. Additionally, Trinity Industries-North Plant Site's stormwater discharges into the Old Erie Canal, as noted by Trinity in their "Response to Comments & Revised RI Report-North Plant" letter dated September 2, 2011. Therefore, Trinity will need to address the sediment impacts in accordance with 25 Pa. Code §§250.311 and 250.402, as well as the guidance provided in Section IV.H of the Land Recycling Technical Guidance Manual.
- Comment No. 9 - Monitoring wells MW-13 and MW-14 have only one water level measurement which was performed in September 2011. In addition, these monitoring wells had no sampling analysis conducted for Site Contaminants of Concern (COCs). Because these wells were installed after the submittal and subsequent approval of the Remedial Investigation Report, please refer to 25 Pa. Code §250.408(e) for the appropriate number of sampling events as these wells are being utilized for additional site characterization.
- General Comments - Trinity concludes that Mathay Run/Old Erie Canal is a hydraulic barrier which intercepts all groundwater contamination leaving the site; thus, preventing groundwater contamination off-site. However, data should be provided in the report to

support this conclusion. At a minimum, Trinity should evaluate this conclusion by providing the following: I) Two quarterly groundwater samples and elevations from MW-13 and MW-14 for site COCs; 2) Concurrent samples and elevations obtained from monitoring wells adjacent to MW-12 and MW-13; 3) Concurrent stream gauge measurements should be obtained; and 4) Concurrent stream samples (for site related COCs) should be collected.

On June 1, 2012, Trinity and Golder met with PADEP in its Meadville, PA offices to present preliminary responses, and agree to a path going forward for revising the Cleanup Plan for PADEP approval. As a follow up to the meeting, Golder sent the Response Letter on July 2, 2012 (discussed above) that addressed PADEP's comments on the Cleanup Plan. In response to PADEP Comment Nos. 5 and 9, as well as the General Comments, the Response Letter included, but was not limited to, the following proposed Site field investigation activities, the results of which are provided in this report:

- Install one additional monitoring well
- Install one additional staff gauge
- Perform two additional groundwater monitoring events
- Perform two additional surface water monitoring events, one representing low flow conditions and the other after a storm event

In response to PADEP comment No. 7, the Response Letter also stated that further sampling would be performed if PADEP provided information that clearly confirmed a stormwater pathway from the Site to the Old Erie Canal. As a follow up to the June 1, 2012 meeting, PADEP visited the Site and Trinity performed several additional investigations of the Site storm sewer system. Those additional investigations demonstrated that there is no direct pathway from the Site stormwater drainage system to either the Old Erie Canal or Mathay Run. These results are discussed in a separate report entitled Stormwater Drainage System Investigations, which is included as an Appendix to the Revised Cleanup Plan.

2.0 SCOPE OF WORK

A field program that was developed to address the above listed investigation activities is described in the following subsections. Figure 1 presents the locations of the additional field investigations. The field procedures were performed in general accordance with the RI Work Plan. Investigation-derived waste (IDW) was placed into 55-gallon steel drums with lids, labeled, and stored in a staging location on-Site for characterization and future disposal.

2.1 Monitoring Network

The Site monitoring network subject to this scope of work is presented on Figure 1 and consisted of the following:

- Fifteen on-Site groundwater monitoring wells (MW-S1 through MW-S15), including the recently installed well described below
- Four staff gauges (SG-S1 through SG-S4) in both the Old Erie Canal and Mathay Run, including the recently installed gauge described below
- Six surface water sampling locations (SW-S1 through SW-S6) in both the Old Erie Canal and Mathay Run

The network of groundwater monitoring wells for the Site also currently includes three off-Site wells on the Canadian National Railway (CN) property to the west of the Site (i.e., MW-CN1, MW-CN2, and MW-CN3). At the time of these field investigations, access to the wells was not available. However, due to their distance from the Mathay Run and considering the previous data from these wells, the omission of water level data from these wells is not considered a meaningful data gap and should not impact the interpretation of groundwater flow in the vicinity of the Mathay Run.

Table 1 presents construction details for the site monitoring network.

2.2 Installation of Additional Monitoring Locations

In accordance with the Response Letter, Golder supervised the installation of the following two additional monitoring locations to support the assertion in the RI Report that Mathay Run acts as a hydraulic barrier:

- MW-S15 – a shallow groundwater monitoring well screened across the water table, located across Mathay Run from the former disposal areas and MW-S6
- SG-S4 – a staff gauge in Mathay Run, located towards the downstream property boundary

After installation, these two locations were surveyed by Howells and Baird, Inc., a Pennsylvania-licensed surveyor. These new locations are shown on Figure 1 and construction details are provided on Table 1.

2.2.1 New Monitoring Well

Well MW-S15 was installed on September 5, 2012 by the Pennsylvania-licensed driller SJB Services, Inc. (SJB). During installation of this 2 inch PVC well, soil samples were collected for visual observation using a split-spoon sampler. Observations of the well installation, including construction details and soil descriptions, were documented on a field boring log. The boring log was converted to an electronic gINT® log and is provided in Attachment A.

This well was installed on a wooded parcel of Site property across Mathay Run from the main property. Accessing this area with drilling equipment was extremely difficult because there are no roads and the creek banks are relatively steep in the area. In addition, access from adjacent properties would have required a legal agreement and extensive site clearing. Because of these access limitations, SJB hand-carried equipment across the creek and installed MW-S15 using a drive hammer mounted on a tripod with a motorized winch.

On the day following completion of construction, the well was developed using a hand bailer to remove over eight well volumes of water until turbidity was reduced in the purged water.

2.2.2 New Staff Gauge

Staff gauge SG-S4 was installed on September 10, 2012 by Howells & Baird. The gauge was 3.33 feet in length and had 0.02-foot increments. It was attached to a metal rod that was driven approximately two feet into the base of the flow channel in the stream. The 0.00-foot gradation on the gauge was set near the bottom of the stream.

On the same day, Howells & Baird reset the metal rod of staff gauge SG-S3. This gauge had shifted from a vertical alignment. Gauges SG-S1 and SG-S2 were also inspected at this time; however, they did not need to be repaired. Following the repair to SG-S3, Howells & Baird surveyed all four staff gauges in the monitoring network.

2.3 Monitoring Events

Two monitoring events for water level measurements and both groundwater and surface water sampling were performed on the following dates:

- September 25 through 27, 2012
- November 6 and 8, 2012

The September monitoring event represented the storm event sampling since those samples were collected during precipitation on September 26, 2012. The rainfall started approximately three hours before the surface water sampling was initiated, with a reported precipitation of greater than 0.3 inches at that time. The rainfall information was obtained from the National Oceanic and Atmospheric

Administration (NOAA) website (http://www.ncdc.noaa.gov/cdo-web/) for the nearest NOAA weather station located in Meadville, Pennsylvania, approximately 20 miles from the site. A discussion about stream water levels during this monitoring event is provided in Section 3.3.

The November monitoring event represented a lower-flow surface water sampling event. Those samples were collected six days after the most recent storm event of greater than 0.1 inch of precipitation on November 2, 2012. While there was precipitation of less than 0.1 inch per day on November 3-6, 2012, there was no recorded precipitation on November 7 or November 8, 2012 and surface water sampling was performed on November 8. It should be noted that this event was originally scheduled for week of October 29, but was rescheduled due to Hurricane Sandy.

2.3.1 Water Levels

On the first day of each monitoring event, synoptic water levels were measured at both the fifteen on-Site wells and the four staff gauges. The measurements were made prior to disturbance of the water levels by the sampling equipment.

2.3.2 Groundwater Sampling

For the September 2012 event, samples were collected from the following six wells in the vicinity of the former disposal areas, Mathay Run, and the Old Erie Canal:

- MW-S5
- MW-S6
- MW-S11
- MW-S13
- MW-S14
- MW-S15

For the November 2012 event, samples were collected from a total of eight wells, including the above listed six wells and both MW-S1, which is adjacent to the former disposal areas, and MW-S4, which is adjacent to the Old Erie Canal at the up-gradient portion of the Site.

For both monitoring events, groundwater samples were obtained using low-flow sampling techniques in general accordance with the RI Work Plan. Water levels were measured in each well prior to installing the sampling pump and then during purging. Field parameters were measured during purging using a calibrated field meter and flow-through cell. These measurements were recorded on field forms. Quality control samples for field duplicates, matrix spikes, and equipment blanks from a sampling pump were also collected in accordance with the RI Work Plan.

The groundwater samples were submitted to TestAmerica Laboratories, Inc. (TestAmerica) for analysis for arsenic, lead, and manganese (total and dissolved) by USEPA SW-846 Method 6020. The samples for dissolved analyses were field-filtered with 0.45 µm in-line, disposable filters prior to field preservation with nitric acid.

2.3.3 Surface Water Sampling

For both the September and November 2012 events, samples were collected from the following six surface water locations:

- Mathay Run locations
  - SW-S1
  - SW-S2
  - SW-S3
- Old Erie Canal locations
  - SW-S4
  - SW-S5
  - SW-S6

For both monitoring events, grab samples were obtained by directly filling the sample bottles from the surface flow of the water body. While the sample bottles were being filled, field parameter readings were measured by placing the meter probes into the water body slightly downstream of the sample collection location. Quality control samples for field duplicates and matrix spikes were collected in accordance with the RI Work Plan.

The surface water samples were submitted to TestAmerica for analysis of arsenic, lead, and manganese (total and dissolved) by USEPA SW-846 Method 6020. The samples for dissolved analyses were filtered by the laboratory, thus they were submitted without the addition of nitric acid as a field preservative.

3.0 RESULTS AND DISCUSSION

3.1 Water Levels

The measured water levels from September and November 2012 events are presented in Table 2 for the groundwater wells and Table 3 for the staff gauges. These tables also include historic measurements by Golder at the Site. The tables provide water level elevations that have been calculated using surveyed measuring points at each location.

Figure 2 presents the inferred groundwater contours for the Site from the September and November 2012 events, as well as four contour maps that correspond with previous groundwater sampling events (i.e., March 2008, April 2008, March 2009, and May 2009). Other synoptic water level measurements have been made at the Site with associated contour maps presented in the RI Report and Cleanup Plan.

The contours shown on Figure 2 are relatively consistent from event to event. It should be noted that the 2008 and 2009 contours have been updated from those presented in the RI Report to reflect the inferred influence of the Borough of Greenville's 24-inch storm sewer on groundwater flow at the Site.

The following comments are based on the water level data measured at the Site and presented on Figure 2:

- SG-S1 – In March and May 2009, surface water levels at this Old Erie Canal location were lower than the water levels in nearby well MW-S4 indicating that the Old Erie Canal is a gaining stream.

  In 2012, however, the flow appeared to have reversed with observed surface water levels at SG-S1 both higher than those in MW-S4 and lower than the levels observed at downstream staff gauge SG-S2, indicating that water was backing up downstream. However, these observations coincided with Golder's observations in September 2012 that beavers were starting to build a dam across the Old Erie Canal at its confluence with Mathay Run. During the November 2012 sampling event, the dam was observed to be more substantial.
- SG-S2 – Surface water levels at this Old Erie Canal location were consistently below nearby well MW-S5 and more distant well MW-S8. The mounding of groundwater observed in the vicinity of these wells is likely attributed to a broken storm drain that was identified during the November-December 2012 stormwater drainage system investigations. These water levels indicate that the Old Erie Canal is a gaining stream.
- SG-S3 – Surface water levels at this Mathay Run location (just downstream of the confluence with the Old Erie Canal) were typically lower than nearby, and somewhat downstream, well MW-S6. The exception shown on Figure 2 was for September 2012 when surface water flow was elevated due to a storm event. Since the Mathay Run water levels were typically below the groundwater level measured in MW-S6, Mathay Run is considered to be a gaining stream, and acts as a groundwater divide in this area.
- SG-4 - Water levels at this recently installed staff gauge in Mathay Run were lower than those observed in nearby wells MW-S11 and MW-S13. Water levels in MW-S13 have been observed higher than MW-S11. Since the Mathay Run water level was below the

aquifer water level measured in the nearby wells, this water body is considered to be a gaining stream, and acts as a groundwater divide in this area.

The water level data measured in the vicinity of the former disposal areas are consistent with the assertion that Mathay Run is a hydraulic barrier, preventing COCs in groundwater from reaching areas on the other side of the creek.

3.2 Groundwater Results

Field parameters measured during the September and November 2012 groundwater sampling events are presented in Tables 4 and Table 5, respectively. They show the initial water levels measured prior to sampling pump placement and the final (i.e., stabilized) field parameter readings measured at the end of purging.

Following receipt of the chemical analysis results, Golder validated the data in accordance with the RI Work Plan. The groundwater results for total and dissolved metals were tabulated and compared to the Pennsylvania residential medium-specific concentrations (MSCs) for used aquifers with total dissolved solids (TDS) less than or equal to 2,500 mg/L (see Table 6). The laboratory analytical reports are provided in Attachment B.

In general, the groundwater analytical results for the September and November 2012 monitoring events were consistent with the previous RI results. A summary of the recent results is provided below:

- Arsenic
  - Dissolved results were below the MSC of 10 µg/L during both events for all but one well, MW-S6, which was slightly above the MSC
  - Total results were slightly above the MSC at up-gradient well MW-S4, and wells MW-S6, MW-S13, MW-S14 and MW-S15 during at least one of the events
- Lead
  - Dissolved results were below the MSC of 5 µg/L during both events for all wells
  - Total results were below the MSC during both events for all but two wells with slight exceedances: MW-S14 had a detection of 6 µg/L in September 2012 and MW-S15 had a detection of 6 µg/L in November 2012
- Manganese
  - Dissolved and total results were similar for each well during each event
  - Results were typically above the MSC of 300 µg/L
  - Only wells MW-S1, MW-S4, and MW-S5 had results below the MSC
  - Wells across Mathay Run (MW-S13 and MW-S15) had results above the MSC, but there was no apparent correlation with wells near the disposal areas (MW-S11 and MW-S6)
  - Wells with lower ORP values generally had the highest manganese concentrations

The observed correlation between higher manganese concentrations and low (e.g., negative) ORP values on both sides of a hydraulic barrier, Mathay Run, supports the RI Report assertion that manganese in soil is being mobilized by reducing conditions in groundwater resulting from the degradation of organic materials in floodplain soils (alluvium).

3.3 Surface Water Results

Field readings measured during the September and November 2012 surface water sampling events are provided on Tables 7 and 8, respectively. They present field parameter meter readings for both events. It is noted that turbidity readings were higher for the storm surface water sampling event (September 2012) compared to the lower-flow event (November 2012).

In addition, Table 7 (September 2012 event) presents surface water elevations calculated from staff gauge readings that were measured during surface water sampling. These elevations show that the stream levels were higher when compared to Site-wide water levels measured the previous day (see Table 3 and Sections 2.3.1 and 3.1) and the surface water gradient between SG-S3 and SG-S4 was steeper (0.0070 feet/foot compared to 0.0063 feet/foot) during sampling indicating a higher stream velocity and flow during the precipitation event.

Additional staff gauge measurements were not recorded during the November 2012 sample collection because there was less than 0.1-inch of precipitation between Site-wide water level measurements and surface water sampling. Therefore, the Site-wide synoptic measurements on November 6, 2012 are considered to represent stream levels for surface water sampling on November 8, 2012.

Following receipt of the chemical analysis results, Golder validated the data in accordance with the RI Work Plan. The laboratory analytical reports are provided in Attachment B. The surface water results for total and dissolved metals were tabulated (see Table 9) and compared to the Pennsylvania specific water quality criteria for manganese found in 25 PA Code §93.7 and the following Pennsylvania water quality criteria for toxic substances (see Table 9) found in 25 PA Code §93.8c for arsenic and lead:

- Criteria Continuous Concentrations (CCC) for fish and aquatic wildlife
- Criteria Maximum Concentrations (CMC) for fish and aquatic wildlife
- Human Health Criteria

Note that the manganese standard is applicable for potable water systems (PWS) and is listed in Table 9 under human health criteria.

The following discusses the chemical analysis results for the surface water samples collected during the September and November 2012 monitoring events:

- Arsenic
  - Dissolved and total results were below all applicable criteria during both events
- Lead
  - Dissolved results were below all applicable criteria during both events
  - Total results were above the CCC for each location during the storm sampling event (September 2012). In addition, one of the highest results was observed at SW-S3 (see Figure 1), which represents the background/upstream condition for Mathay Run
  - Total results were below the MCC for each location during both events
  - Total results were below all applicable criteria during for the lower-flow event (November 2012)
- Manganese
  - Dissolved and total results were below all applicable criteria during both events

Total lead was the only exceedance of any applicable criteria for the COCs in the surface water samples. However, these CCC exceedances were observed only during storm event sampling and in all locations including the background/upstream location for Mathay Run. Therefore, these lead exceedances appear to be related to urban stormwater runoff and not related to the Site. In summary, the surface water sampling did not show any impacts related to Site COCs resulting from either direct discharge from the Site or diffuse groundwater flow to the Old Erie Canal or Mathay Run.

4.0 CONCLUSIONS

The following conclusions and recommendations are based upon the results of additional groundwater and surface water sampling performed at the Site in September and November 2012:

- Conclusions
  - Water levels measured in the vicinity of the former disposal areas, the Old Erie Canal, and Mathay Run were consistent with the assertion in the RI Report that the Old Erie Canal and Mathay Run are gaining streams and are acting as a hydraulic barrier to off-Site transport of COCs in groundwater under low flow and storm flow conditions.
  - There is no correlation between groundwater concentrations in the vicinity of the former disposal areas and concentrations in wells across Mathay Run.
  - The observed correlation between higher manganese concentrations and low (e.g., negative) ORP values on both sides of a hydraulic barrier, Mathay Run, supports the RI Report assertion that manganese in soil is being mobilized by reducing conditions in groundwater resulting from the degradation of organic materials in floodplain soils (alluvium).
  - Total lead was the only exceedance of any applicable criteria for the COCs in the surface water samples including the background/upstream location for Mathay Run. Therefore, these lead exceedances appear to be related to urban stormwater runoff and not related to the Site.
  - There are no exceedances of ambient water quality criteria of Site related COCs in either the Old Erie Canal or Mathay Run resulting from either direct discharge or diffuse groundwater flow from the Site.
- Recommendations
  - No further groundwater or surface water investigations are necessary to determine the off-Site fate and transport of Site related COCs.

TABLES

Table 1
Monitoring Well and Staff Gauge Construction
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

I.D.	Date Installed	Coordinates (ft)		Ground Surface [ft MSL]	Measuring Point[3] [ft MSL]	Top of Screen [ft bgs]	Top of Screen [ft MSL]	Bottom of Screen [ft bgs]	Bottom of Screen [ft MSL]
		(Y) North	(X) East						
MW-S1	01/25/08	457620.1800	1244865.1177	936.10	938.67	5	931.10	15	921.10
MW-S2	01/23/08	459075.8848	1245027.5792	938.86	941.43	5	933.86	15	923.86
MW-S3	01/23/08	459983.2808	1245438.8666	940.51	942.82	5	935.51	15	925.51
MW-S4	01/22/08	459242.3214	1245958.1522	939.52	942.08	8	931.52	18	921.52
MW-S5	01/24/08	458332.4692	1245902.6806	940.18	942.73	5	935.18	15	925.18
MW-S6	01/28/08	457951.1315	1245319.6699	939.65	942.51	5	934.65	15	924.65
MW-S7	01/24/08	458734.2683	1245488.3252	939.35	941.82	5	934.35	15	924.35
MW-S8	01/23/08	458594.0590	1245723.6409	939.07	941.69	5	934.07	15	924.07
MW-S9	01/24/08	458472.2793	1244787.4933	938.77	941.27	5	933.77	15	923.77
MW-S10	02/24/09	457777.1065	1244532.9170	938.69	941.05	7	931.69	17	921.69
MW-S11	02/24/09	457589.7219	1245132.7800	935.81	938.23	5	930.81	15	920.81
MW-S12	02/24/09	458833.1837	1245247.4100	938.83	941.23	6	932.83	16	922.83
MW-S13	08/17/11	457585.2520	1245193.8900	937.12	939.79	5	932.12	10	927.12
MW-S14	08/16/11	458224.9220	1245520.7720	939.09	941.88	5	934.09	15	924.09
MW-S15	09/05/12	457851.8096	1245346.9511	936.73	938.86	1.5	935.23	8.5	928.23
MW-CN1	02/26/09	460000.9724	1245201.3490	943.00	942.88	8.5	934.50	18.5	924.50
MW-CN2	02/26/09	458434.9794	1244609.4380	941.32	941.24	10	931.32	20	921.32
MW-CN3	UK	458868.0686	1244783.0386	942.46	942.12	UK	UK	UK	UK
MW-CN4[1]	UK	459183.0455	1244902.6506	942.88	942.26	UK	UK	UK	UK
SG-S1[2]	09/08/08	459369.3772	1245961.1341	NA	938.40	NA	NA	NA	NA
SG-S2[2]	09/08/08	458294.3500	1245922.5400	NA	937.43	NA	NA	NA	NA
SG-S3[2]	09/08/08	457959.7339	1245375.2693	NA	936.82	NA	NA	NA	NA
SG-S4[2]	09/06/12	457567.9127	1245141.1757	NA	935.21	NA	NA	NA	NA

Notes:
[1] MN-CN4 decomissioned by others after May 2009 monitoring
[2] Staff gauges resurveyed September 2012
[3] Surveyed measuring point for water levels is either the top of inner well casing or the top of the staff gauge

Abbreviations:
ft MSL - feet above Mean Sea Level
ft bgs - feet below ground surface
UK - Unknown
SG - Staff Gauge
NA - Not Applicable

Table made by: KMC 12/10/12
Table checked by: RSA 12/10/12

Ground
Additional Groundwate
Trinity Industrie
Gr

WELL I.D.	Ground Surface [ft MSL]	Measuring Point [ft MSL]	March 4, 2008		April 28, 2008		June 9, 2008	
			Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groun Elev [ft
MW-S1	936.10	938.67	3.89	934.78	5.59	933.08	6.36	93
MW-S2	938.86	941.43	5.01	936.42	5.72	935.71	6.14	93
MW-S3	940.51	942.82	5.37	937.45	6.05	936.77	6.26	93
MW-S4	939.52	942.08	5.35	936.73	6.56	935.52	6.64	93
MW-S5	940.18	942.73	4.55	938.18	6.05	936.68	6.45	93
MW-S6	939.65	942.51	6.15	936.36	7.49	935.02	8.31	93
MW-S7	939.35	941.82	4.75	937.07	6.13	935.69	6.32	93
MW-S8	939.07	941.69	4.15	937.54	5.53	936.16	5.87	93
MW-S9	938.77	941.27	5.71	935.56	6.85	934.42	7.38	93
MW-S10	938.69	941.05						
MW-S11	935.81	938.23						
MW-S12	938.83	941.23						
MW-S13	937.12	939.79						
MW-S14	939.09	941.88						
MW-S15	936.73	938.86						
MW-CN1	943.00	942.88						
MW-CN2	941.32	941.24						
MW-CN3	942.46	942.12						
MW-CN4	942.88	942.26						

WELL I.D.	Ground Surface [ft MSL]	Measuring Point [ft MSL]	June 22, 2009		November 22, 2011		December 19, 2	
			Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Grour Ele [ft
MW-S1	936.10	938.67	5.33	933.34	5.37	933.30	4.92	93
MW-S2	938.86	941.43	5.30	936.13	5.51	935.92	5.23	93
MW-S3	940.51	942.82	5.78	937.04	5.87	936.95	5.63	93
MW-S4	939.52	942.08	6.25	935.83	6.64	935.44	6.54	93
MW-S5	940.18	942.73	5.64	937.09	6.22	936.51	5.94	93
MW-S6	939.65	942.51	7.14	935.37	7.25	935.26	6.91	93
MW-S7	939.35	941.82	5.34	936.48	5.69	936.13	5.40	93
MW-S8	939.07	941.69	4.84	936.85	5.32	936.37	4.96	93
MW-S9	938.77	941.27	6.25	935.02	6.44	934.83	6.02	93
MW-S10	938.69	941.05	8.25	932.80	7.89	933.16	7.16	93
MW-S11	935.81	938.23	4.09	934.14	4.23	934.00	3.92	93
MW-S12	938.83	941.23	7.09	934.14	7.23	934.00	6.84	93
MW-S13	937.12	939.79	4.09	935.70	5.65	934.14	5.41	93
MW-S14	939.09	941.88	7.09	934.79	6.02	935.86	5.55	93
MW-S15	936.73	938.86						
MW-CN1	943.00	942.88	5.63	937.25	NM	NA	NM	
MW-CN2	941.32	941.24	6.27	934.97	NM	NA	NM	
MW-CN3	942.46	942.12	6.52	935.60	NM	NA	NM	
MW-CN4[1]	942.88	942.26	NM	NA	NM	NA	NM	

Notes:
[1] MW-CN4 adecommissioned by others after May 4, 2009 reading

Abbreviations:
ft MSL - feet Above M
ft bmp - feet below n
MW - Groundwater M

ɜ 2
Elevations
Surface Water Monitoring
. - South Plant Site
le, PA

r	September 8, 2008		September 9, 2008		March 9, 2009		May 4, 2009	
	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]
	6.95	931.72	6.83	931.84	3.75	934.92	5.67	933.00
	6.58	934.85	6.47	934.96	5.02	936.41	5.76	935.67
	6.68	936.14	6.64	936.18	5.34	937.48	5.91	936.91
	6.97	935.11	6.77	935.31	5.38	936.70	6.45	935.63
	6.90	935.83	6.75	935.98	4.72	938.01	6.06	936.67
	8.89	933.62	8.74	933.77	5.98	936.53	7.55	934.96
	7.78	934.04	6.70	935.12	4.82	937.00	5.82	936.00
	6.37	935.32	6.28	935.41	4.05	937.64	5.37	936.32
	8.93	932.34	7.91	933.36	5.48	935.79	6.82	934.45
					6.71	934.34	8.40	932.65
					3.10	935.13	4.43	933.80
					6.12	935.11	7.43	933.80
					3.10	936.69	4.43	935.36
					6.12	935.76	7.43	934.45
					5.30	937.58	5.85	937.03
					5.52	935.72	6.84	934.40
					6.10	936.02	6.94	935.18
					5.95	936.31	6.64[3]	935.62

r	September 25, 2012		November 6, 2012	
	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]	Depth to Water [ft bmp]	Groundwater Elevation [ft MSL]
	6.35	932.32	4.76	933.91
	5.98	935.45	5.05	936.38
	6.47	936.35	5.63	937.19
	6.57	935.51	6.13	935.95
	5.98	936.75	5.58	937.15
	8.07	934.44	6.80	935.71
	5.94	935.88	5.32	936.50
	5.56	936.13	4.71	936.98
	7.33	933.94	5.71	935.56
	9.63	931.42	7.05	934.00
	5.11	933.12	3.90	934.33
	7.30	933.93	6.86	934.37
	5.36	934.43	5.42	934.37
	6.85	935.03	5.34	936.54
	4.19	934.67	3.68	935.18
	NM	NA	NM	NA
	NM	NA	NM	NA
	NM	NA	NM	NA
	NM	NA	NM	NA

a Level
ıg point
ıg Well

NA - Not Applicable
NM - Not Measured

Table made by: KMC 12/10/12
Table checked by: RSA 12/11/12

Golder Associates

Surface
Additional Groundwate
Trinity Industrie
Gr

STAFF GAUGE I.D.	Surveyed Elevation[1] [ft MSL]	September 8, 2008		September 9, 2008		March 9, 2009		Ma
		Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]
SG-S1	938.54	0.40	935.61	0.50	935.71	1.20	936.41	0.23
SG-S2	937.39	0.80	934.86	1.14	935.20	2.35	936.41	0.83
SG-S3	937.02	0.90	934.59	1.32	935.01	2.40	936.09	1.18

STAFF GAUGE I.D.	Surveyed Elevation[1,2] [ft MSL]	September 25, 2012		November 6, 2012	
		Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]
SG-S1	938.40	0.58	935.65	1.46	936.53
SG-S2	937.43	1.60	935.70	2.48	936.58
SG-S3[3]	936.82	1.74	935.23	1.94	935.43
SG-S4[4]	935.21	0.50	932.38	0.72	932.60

Notes:
1) Top of gauge; survey point is 3.33 ft above 0.00 mark
2) Staff gauges resurveyed September 2012
3) Staff gauge repaired September 2012 prior to survey
4) Staff gauge installed September 2012

Abbreviations:
ft MSL - feet above Mean Sea Leve

le 3
er Elevations
l Surface Water Monitoring
c. - South Plant Site
ille, PA

2009	June 22, 2009		September 22, 2011		November 22, 2011		December 19, 2011	
Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]	Water Depth [ft]	Surface Water Elevation [ft MSL]
935.44	0.27	935.48	0.19	935.40	0.16	935.37	0.20	935.41
934.89	0.90	934.96	1.04	935.10	0.95	935.01	1.125	935.19
934.87	1.30	934.99	1.33	935.02	1.30	934.99	1.51	935.20

Table made by: KMC 12/10/12
Table checked by: RSA 12/11/12

Golder Associates

Table 4
Groundwater Sampling Field Parameters - September 2012
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

Well I.D.	Date	Temperature [°C]	pH [std. unit]	Specific Conductance [mS/cm]	Turbidity [ntu]	Dissolved Oxygen [mg/l]	ORP [mV]	Depth to Water[1] [ft bmp]	Groundwater Elevation[1,2] [ft]
MW-S5	09/27/12	13.4	6.52	0.408	0.1	6.75	66	5.99	936.74
MW-S6	09/26/12	12.9	7.13	0.450	1.9	1.26	-118	7.85	934.66
MW-S11	09/26/12	14.0	6.76	0.507	15.4	1.42	-74	5.15	933.08
MW-S13	09/26/12	14.0	7.01	0.388	0.0	1.14	-94	6.12	933.67
MW-S14	09/27/12	14.3	6.70	0.456	0.7	1.87	-58	6.08	935.80
MW-S15	09/25/12	14.7	6.53	0.406	0.0	1.54	-66	4.25	934.61

Notes:
[1] Measured prior to purging. Other parameters shown represent final (stabilized) readings taken prior to sampling.
[2] Calculated using survey information provided on Table 1.

Table made by: KMC 12/10/12
Table checked by: RSA 12/11/12

Abbreviations:
°C - degrees Celcius
std. unit - standard unit
ORP - Oxidation Reduction Potential
mS/cm - millisiemens per centimeter
ntu - nephelometric turbidity units
mg/l - milligrams per liter
mV - milliVolts
ft bmp - feet below measuring point
ft - feet

Table 5
Groundwater Sampling Field Parameters - November 2012
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

Well I.D.	Date	Temperature [°C]	pH [std. unit]	Specific Conductance [mS/cm]	Turbidity [ntu]	Dissolved Oxygen [mg/l]	ORP [mV]	Depth to Water[1] [ft bmp]	Groundwater Elevation[1,2] [ft]
MW-S1	11/06/12	11.7	5.71	0.240	0.0	1.29	177	4.91	933.76
MW-S4	11/08/12	16.5	6.91	0.321	25.7	2.61	-82	6.23	935.85
MW-S5	11/08/12	12.6	6.52	0.371	3.4	2.43	89	5.70	937.03
MW-S6	11/08/12	12.6	6.63	0.486	18.9	1.85	-71	6.95	935.56
MW-S11	11/06/12	11.9	6.58	0.814	0.0	0.78	-53	4.30	933.93
MW-S13	11/06/12	11.4	6.56	0.331	0.0	1.05	-37	5.44	934.35
MW-S14	11/08/12	13.1	6.25	0.363	10.2	2.26	11	5.72	936.16
MW-S15	11/06/12	11.9	6.36	0.350	22.7	0.98	-15	6.16	932.70

Notes:
[1] Measured prior to purging. Other parameters shown represent final (stabilized) readings taken prior to sampling.
[2] Calculated using survey information provided on Table 1.

Table made by: KMC 12/10/12
Table checked by: RSA 12/11/12

Abbreviations:
°C - degrees Celcius
std. unit - standard unit
ORP - Oxidation Reduction Potential
mS/cm - millisiemens per centimeter
ntu - nephelometric turbidity units
mg/l - milligrams per liter
mV - milliVolts
ft bmp - feet below measuring point
ft - feet

Table 6
Validated Groundwater Analytical Results
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

		Sample ID	MW-S1			MW-S4			MW-S5			MW-S5			MW-S6			MW-S6			MW-S11			MW-S11		
		Sample Date	11/6/2012			11/8/2012			9/27/2012			11/8/2012			9/26/2012			11/8/2012			9/26/2012			11/6/2012		
		N=Normal, FD=Field Duplicate	N			N			N			N			N			N			N			N		
Parameter	Unit	PADEP MSCs Used Aquifer Residential TDS <=2500	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL
Total Metals																										
Arsenic	ug/L	10	1.7	B	1	**19**		1	2.6	B	1	0.85	JB	1	**14**		1	**15**		1	4.3	B	1	5.1		1
Lead	ug/L	5	0.35	JB	1	0.92	JB	1	1.8	B	1	0.37	JB	1	2.3		1	0.85	JB	1	0.34	JB	1	0.73	JB	1
Manganese	ug/L	300	210		5	240		5	99		5	45		5	**1300**		5	**3200**		5	**1900**		5	**4100**		5
Dissolved Metals																										
Arsenic	ug/L	10	0.73	J	1	9.7		1	1.2		1	1	U	1	**11**		1	**13**		1	3.7		1	3		1
Lead	ug/L	5	0.085	J	1	0.026	J	1	1.5	J	1	0.019	J	1	1.7		1	0.086	J	1	1.8		1	1	U	1
Manganese	ug/L	300	210		5	200		5	98	J	5	41		5	**1300**		5	**2900**		5	**1900**		5	**4000**		5

Abbreviations:
Qual - interpreted qualifier
RDL - reporting detection limit
ug/L - micrograms per liter

Results above the 2011 PADEP Groundwater MSCs are shown in bold.

Qualifers:
B - blank contamination
J - estimated result
JB - estimated result, blank contamination
U - not detected above RDL

Checked by: AMZ 12/7/2012

Golder Associates

Table 6
Validated Groundwater Analytical Results
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

		Sample ID	MW-S13			MW-S13			MW-S14			MW-S14			MW-S14			MW-S14			MW-S15			MW-S15		
		Sample Date	9/26/2012			11/6/2012			9/27/2012			9/27/2012			11/8/2012			11/8/2012			9/26/2012			11/6/2012		
		N=Normal, FD=Field Duplicate	N			N			N			FD			N			FD			N			N		
Parameter	Unit	PADEP MSCs Used Aquifer Residential TDS <=2500	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL
Total Metals																										
Arsenic	ug/L	10	**11**	**B**	1	7.1		1	**12**		1	**16**		1	3.7		1	3.2		1	7.9	B	1	**13**		1
Lead	ug/L	5	1.2	B	1	0.25	JB	1	5		1	**6**		1	0.31	JB	1	0.33	JB	1	3.2		1	**6**		1
Manganese	ug/L	300	**1200**		5	**690**		5	**1100**		5	**1100**		5	**650**		5	**660**		5	**2100**		5	**1300**		5
Dissolved Metals																										
Arsenic	ug/L	10	8.2		1	6.3		1	4.2		1	4.9		1	2.7		1	2.1		1	7.9		1	8.1		1
Lead	ug/L	5	0.067	JB	1	1	U	1	1.6		1	1.9		1	1	U	1	0.065	J	1	1.8		1	0.046	J	1
Manganese	ug/L	300	**1300**		5	**660**		5	**1100**		5	**1200**		5	**630**		5	**530**		5	**2000**		5	**1400**		5

Abbreviations:
Qual - interpreted qualifier
RDL - reporting detection limit
ug/L - micrograms per liter

Results above the 2011 PADEP Groundwater MSCs are shown in bold.

Qualifers:
B - blank contamination
J - estimated result
JB - estimated result, blank contamination
U - not detected above RDL

Checked by: AMZ 12/7/2012

Table 7
Surface Water Sampling Field Parameters - September 2012
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

Sample I.D.	Date	Time	Temperature [°C]	pH [std. unit]	Specific Conductance [mS/cm]	Turbidity [ntu]	Dissolved Oxygen [mg/l]	ORP [mV]	Nearest Staff Gauge	Staff Gauge Reading [ft]	Surface Water Elevation [ft MSL]
SW-S1	09/26/12	9:50	13.1	7.38	0.510	10.0	5.80	-17	SG-S4	0.61	932.49
SW-S2	09/26/12	10:50	13.4	7.50	0.502	6.3	5.78	-2	SG-S3	2.20	935.69
SW-S3	09/26/12	11:25	13.6	7.72	0.280	19.3	9.07	-34	SG-S2	1.73	935.83
SW-S4	09/26/12	11:50	15.2	7.67	0.321	13.4	4.56	-25	SG-S3	2.20	935.69
SW-S5	09/26/12	12:10	15.6	7.90	NM	24.1	7.01	12	SG-S2	1.73	935.83
SW-S6	09/26/12	12:25	16.4	7.84	NM	6.4	8.21	43	SG-S1	0.87	935.94

Abbreviations:
ORP - Oxidation Reduction Potential
mS/cm - millisiemens per centimeter
ntu - nephelometric turbidity units
mg/l - milligrams per liter
mV - milliVolts
ft MSL - feet above Mean Sea Level
NM - Not Measured
NA - Not Applicable

Table made by: KMC 12/10/12
Table checked by: RSA 12/17/12

Golder Associates

Table 8
Surface Water Sampling Field Parameters - November 2012
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

Sample I.D.	Date	Time	Temperature [°C]	pH [std. unit]	Specific Conductance [mS/cm]	Turbidity [ntu]	Dissolved Oxygen [mg/l]	ORP [mV]
SW-S1	11/08/12	14:30	7.4	7.44	0.328	8.8	7.98	169
SW-S2	11/08/12	14:40	6.4	7.34	0.330	0.0	13.75	165
SW-S3	11/08/12	15:03	5.4	7.17	0.275	0.0	9.15	144
SW-S4	11/08/12	15:10	6.0	7.15	0.608	0.0	14.51	173
SW-S5	11/08/12	16:30	6.2	6.99	0.645	0.0	8.44	163
SW-S6	11/08/12	16:50	8.8	7.19	0.701	0.0	5.95	155

Abbreviations:
ORP - Oxidation Reduction Potential
mS/cm - millisiemens per centimeter
ntu - nephelometric turbidity units
mg/l - milligrams per liter
mV - milliVolts
ft MSL - feet above Mean Sea Level
NM - Not Measured
NA - Not Applicable

Table made by: KMC 12/10/12
Table checked by: RSA 12/17/12

Golder Associates

Table 9
Validated Surface Water Analytical Results
Additional Groundwater and Surface Water Monitoring
Trinity Industries, Inc. - South Plant Site
Greenville, PA

					Sample ID	SW-S1			SW-S1			SW-S2			SW-S2			SW-S2			SW-S3			SW-S3			SW-S3		
					Sample Date	9/26/2012			11/8/2012			9/26/2012			9/26/2012			11/8/2012			9/26/2012			11/8/2012			11/8/2012		
					N=Normal, FD=Field Duplicate	N			N			N			FD			N			N			N			FD		
		PA Water Quality Criteria for Toxic Substances																											
		Fish and Aquatic Life Criteria		Human Criteria																									
Parameter	Unit	Criteria Continuous Concentrations	Criteria Maximum Concentrations	Health Criteria	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL
Total Metals																													
Arsenic	ug/L	150	340	10	1	U	1	1	U	1	2.8	J	1	1.6	J	1	0.76	J	1	1.9		1	1	UJ	1	0.31	J	1
Lead*	ug/L	2.2	57.5	NS	**2.3**		1	0.46	J	1	**9.6**		1	**13**		1	0.27	J	1	**11**		1	0.76	J	1	1.5	J	1
Manganese	ug/L	NS	NS	1000	350		5	170		5	460		5	510		5	140		5	440		5	100		5	140		5
Dissolved Metals																													
Arsenic	ug/L	150	340	10	0.81	J	1	0.91	J	1	1	UJ	1	0.47	J	1	0.91	J	1	1	U	1	1	UJ	1	0.46	J	1
Lead*	ug/L	2.2	57	NS	0.11	JB	1	1	U	1	0.23	JB	1	0.12	JB	1	1	U	1	0.21	JB	1	1	U	1	1	U	1
Manganese	ug/L	NS	NS	1000	320		5	86		5	290		5	300		5	81		5	190		5	16	J	5	1.9	JB	5

					Sample ID	SW-S4			SW-S4			SW-S5			SW-S5			SW-S6			SW-S6		
					Sample Date	9/26/2012			11/8/2012			9/26/2012			11/8/2012			9/26/2012			11/8/2012		
					N=Normal, FD=Field Duplicate	N			N			N			N			N			N		
		PA Water Quality Criteria for Toxic Substances																					
		Fish and Aquatic Life Criteria		Human Criteria																			
Parameter	Unit	Criteria Continuous Concentrations	Criteria Maximum Concentrations	Health Criteria	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL	Result	Qual	RDL
Total Metals																							
Arsenic	ug/L	150	340	10	1	U	1	0.49	J	1	1.6		1	1.4		1	0.66	J	1	1	U	1
Lead*	ug/L	1.9	50	NS	**6.9**		1	1.5		1	**15**		1	**9**		1	**6.3**		1	0.32	J	1
Manganese	ug/L	NS	NS	1000	95		5	140		5	73		5	300		5	53		5	46		5
Dissolved Metals																							
Arsenic	ug/L	150	340	10	1.1		1	0.77	J	1	1	U	1	1	U	1	1.9		1	0.94	J	1
Lead*	ug/L	1.9	48.3	NS	0.63	J	1	0.032	J	1	0.47	JB	1	0.039	J	1	0.34	JB	1	1	U	1
Manganese	ug/L	NS	NS	1000	71		5	2.9	J	5	23		5	2.2	JB	5	18		5	41		5

Abbreviations:
Qual - interpreted qualifier
RDL - reporting detection limit
ug/L - micrograms per liter

Qualifers:
J - estimated result
JB - estimated result, blank contamination
U - not detected above RDL

Results above the PA Water Quality Criteria for Toxic Substances are shown in bold.
* The lowest PA Water Quality Criteria calculated during the December 2007 event for lead are shown above

Checked by: AMZ 12/7/2012